Volume 93 Number 16

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

WITH a new conservatism evident in the minds of administration leaders, the apparent gradual dissolution of the leftward-veering "brain trust" and conversion of Liberty bonds into a new issue at lower interest, a sound-money policy (p. 13) appears more certain and the currency inflation threat less likely of materializing. Yet the very threat of inflation with its attendant higher prices has undoubtedly been responsible for putting current business in a bad hole, for much of recent buying (p. 45) has been of a "borrowing from the future" variety. The net result may mean seriously depleted order books for the fourth-quarter and early 1934, for stocks of steel now on hand, in many instances, approach record highs.

Operating Rate Up, but Future Dark

Specifying against old contracts, and not new business, is solely responsible for maintaining the present operating rate in mills, which last week (p. 17) took new lease on life and climbed two points to 40 per cent. The outlook, however, becomes somewhat obscure. Automotive plants, with huge stocks of material already on hand and now concentrating on revising designs, rather than on production, cannot be looked to for any large-tonnage bookings. New cars apparently are planning a wholesale changeover (p. 15) to independent springing, at least of front wheels. This design innovation, while doing away with axles, will not change steel requirements appreciably.

Labor Troubles Yield to Arbitration

Abatement of the die makers' strike considerably eased the automotive situation, and the smoothing of labor difficulties in other industries likewise (p. 11) is achieving success. Steel companies probably made the greatest concession to organized labor in their history in recognizing the checkoff system at captive coal mines. This was done under government pressure, with the reservation that employes would not be coerced into joining labor unions. . . . Despite settlement of coal strikes, fuel prices are higher, coke being increased $1.25 a ton in quantity lots (p. 45); further upward adjustments, in pig iron and alloy steels, are near.

Code Shows Effect on Orders and Extras

Penalties involved in order cancellations under the steel code are suggested as one reason for the fact that the United States Steel Corp. unfilled tonnage on Sept. 30 showed a decline of 114,704 tons to the lowest level since the corporation was formed in 1901. . . . The steel code, however, has lent co-operative strength to the tenet that "extras should stand like the Chinese wall." Despite refinement and improvement of extras on steel products in the

For highlights and shadows, steel excels to the artist. Jones & Laughlin Steel Corp. is distributing this etching of the pouring side of a tilting open-hearth furnace in action

past 20 years, waiving of such charges, forbidden under the code, has always been a problem (p. 20). An official book of extras for the industry has been published by the American Iron and Steel institute, whose directors also have announced (p. 12), further forthcoming resolutions or interpretations of the industry's code.

Germans Throw New Light on Plastic Forming

Scientific study of the plastic forming of metals has not passed beyond the experimental stage, although, as time goes on, fundamental relations are becoming better known. Starting with this issue (p. 23), STEEL presents an important series of articles on this subject, based upon results of extensive tests conducted by a German research institute. The articles are aimed to give a clearer practical understanding of the forces and flow of material in compression, stretching, rolling, drawing, extrusion, piercing and deep drawing . . . . German steelmakers have found (p. 24) that the use of raw lime instead of calcined lime does away with external blistering and porous crowns on open-hearth ingots.

Sheets House Telescopes, Close Pipelines

Two arc-welded steel telescope observatories have been erected in Washington for use of naval department stargazers. Air is circulated between inner and outer sheet steel walls to prevent radiating heat waves from interfering with the beam of light entering the telescope . . . . Welding of galvanized steel sheets (p. 28) has been found to have no serious effects upon the strength or corrosion resistance of the material. Zinc fumes arising in the process, however, are apt to prove troublesome to operators . . . . A novel use for sheet steel has been devised in connection with construction of welded pipelines. Caps of ⅛-inch material are used to seal open ends of pipe sections effectively until they are installed in the line.

Research Develops New Properties, Analyses

A comprehensive study by a leading steelmaker has shown that close control of all quality factors involved in the manufacture of carbon steels is of prime importance in attempts to broaden usefulness of the steel and to improve mechanical and heat treating properties . . . . Manufacture and distribution of stainless steel sheets, strip and plates is being instigated (p. 18) by another pioneer steel interest, two grades to be offered . . . . Interesting commercial possibilities are seen in a semi-rust-resistant steel containing 7 to 9 per cent chromium and a small amount of titanium or columbium . . . . Large amounts of carbon steel are consumed annually (p. 40) in the manufacture of roadside advertising signs.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

"Pessimism and Inconsistency"

To the Editor:

I have just read on page 9 of your Sept. 25 issue, the article entitled "Fear Blue Eagle is Grounded" and I am astonished at the pessimism and inconsistency evident in this article as well as the article on page 13 entitled "Windows of Washington."

I would suggest that as an antidote for this pessimism you obtain a copy of "Listening In" issue of September, and read the article on page 6 entitled "Will It Work" and, perhaps, you will dispense with your steel hammer and purchase a tin horn.

The Blue Eagle cannot thrive if such substance as the articles of your magazine referred to, persist. This criticism is meant in a constructive spirit.

R. J. M.

Louisville, Ky.

Would Promote Harmony

To the Editor:

I would like very much to have the name and address of the writer who signs his name as "Subscriber" on page 10 of your Oct. 2 issue .

This is a spendid article and if the contents of same were put into force, it would do more to correct the evils of the present day and to bring employes and employers to a point where they would work together rather than work apart as they are now doing.

By both working together, each party would be helped by a decreased cost—larger wages, increased income—and a lower cost to the consumer as well.

Some years ago, I published a long article on this same subject.

FRANK O. WELLS

Greenfield, Mass.

Sees Possibilities in Rating Plan

To the Editor:

In STEEL for Oct. 2, 1 saw under "The Voice of Industry," a reference to a new yardstick for salaries. The idea of rating an employe with regard to the assets entrusted to him is not especially new.

You will find an interesting treatment of this subject in the chapter on the "Relative Rating of Workers" in George D. Babcock's book, "Taylor System in Franklin Management," published in 1917. At the time these studies were being carried out with regard to the possible application of the plan to foremen, and other supervisors, the United States went into the World war, and both Col. Babcock and I left the Franklin company shortly thereafter to engage in war work. I believe that the rating process with which we were experimenting has great possibilities and that its further application might well be studied and tried out in industry.

RAY M. HUDSON

Boston

Steel Strikers Returning; Checkoff Wins at Coal Mines

LOSING momentum because Washington continues to frown upon strikes, the absence of pay envelopes was beginning to be felt, and artificial enthusiasm was playing out, both steel and coal strikes last week began fading out of the news.

At Weirton, W. Va., where the Weirton Steel Co. plant was the spearhead of the steel strikers campaign, operations were resumed Tuesday. A few pickets who started to skirmish with returning workers were quickly dispersed by state police. The first day some 3200 men were back at work, the next day 4400, by the end of the week almost all of the 6000.

Operation Is Resumed

Blast was again applied to banked furnaces and open hearths resumed, lifting the steel rate for the Wheeling district from 35 per cent to 45.

Strike leaders at Weirton appealed to the national labor board at Washington, and presented a formula which the board in turn laid before officials at Weirton. The latter maintained there was nothing to mediate.

Some semblance of normalcy was restored at the Clairton, Pa., works of the Carnegie Steel Co., and Tuesday most of the 1000 employes who had remained within the plant returned home for the first time since Sept. 30. At midnight of Tuesday the second shift also went out without any harrying by pickets.

On leaving the Clairton mill each worker who had eaten, slept and worked within Clairton for almost two weeks was handed a letter from Carnegie President Hughes and Clairton Superintendent Marquardt thanking him for "loyalty in performing quietly his regular work in the face of riot and disorder caused by outsiders who had no interest in his welfare or in the peace and good order of his community."

Normal Condition Prevails

Quiet also settled down over Ambridge, Pa., where tear bombs had been necessary to disperse pickets. Incidentally, the Wyckoff Drawn Steel Co. was able to operate throughout the entire disturbance without interference of its operations, and while there was some picketing it was not necessary to post a notice closing the plant.

At Buffalo last week some workmen became restive at the Lackawanna plant of Bethlehem Steel Corp. and the Donner plant of Republic Steel Corp., partially growing out of a misunderstanding due to layoffs necessitated by reduced operations.

Under continued pressure of President Roosevelt and Gen. Hugh S. Johnson, NRA administrator, owners of captive coal mines of steel interests made a further concession, accepting the checkoff system of the United Mine Workers of America.

For the first time in history, so far as is known, union dues will be deducted from pay envelopes by the companies and turned over to the miner's union. A reservation of owners was that employes not wishing to join the union would be protected against "interference, restraint or coercion."

Late Friday President Roosevelt expected the terms would be accepted, but said he was ready to define what working conditions were in order to finally end the negotiations.

Such leading steel interests as United States Steel Corp., Bethlehem Steel Corp., Republic Steel Corp., Youngstown Sheet & Tube Co., Jones & Laughlin Steel Corp., Wheeling Steel Corp., Crucible Steel Co. of America, Interlake Iron Corp., Corrigan McKinney Steel Co., Pickands, Mather & Co., Pittsburgh Steel Co. and others were among those assenting to the checkoff.

From Governor Pinchot, chief peace officer of Pennsylvania, and Mrs. Pinchot emanated much criticism of "the steel trust" and much advice to labor to organize and become militant.

In the steel as in the automobile industry many plants are asking alien born labor to produce citizenship papers or applications.

Codes

MORE vigorously than in any previous hearing, industries represented at the fabricated metal products manufacturing and metal finishing and coating industry code hearings last week insisted upon retention of the merit clause in their code.

Section 7a of the recovery act has caused more misunderstanding than all other sections put together and incorporation of the legal rights of labor without similar incorporation of the legal rights of employers "has caused much strife and threatens to jeopardize the successful operation of the act," declared H. S. Kimball, secretary of the Fabricated Metal Products federation.

Robert A. B. Cook, attorney, Boston, appearing for the Association of Tubular and Split Rivet Manufacturers, not only demanded that the merit clause remain in the code but also insisted that it be strengthened

EXECUTIVE COMMITTEE OF METALS SECTION, NATIONAL SAFETY COUNCIL: Left to right are new officers elected at the recent national congress in Chicago: Vice chairman, J. A. Voss, Republic Steel Corp., Youngstown, O.; general chairman, E. F. Blank, Jones & Laughlin Steel Corp., Pittsburgh; vice chairman, H. W. Darr, Bethlehem Steel Co., Bethlehem, Pa.; secretary, A. Berquist, Youngstown Sheet & Tube Co., East Chicago, Ind. John E. Long, Delaware & Hudson railroad, Albany, N. Y., was elected president of the council, while W. E. Worth, International Harvester Co., Chicago, was chosen treasurer and J. E. Culliney, Bethlehem Steel Co., Bethlehem, a vice president

by the addition of an open shop declaration.

Deputy Administrator King, in charge of the hearing, was noncommittal.

Representatives of labor maintained that if the merit clause stays in the code, workers be given the right to examine books and records to determine whether they were being judged on the basis of merit. Patsy Christmas, a union spokesman, demanded a minimum wage of 70 cents an hour for common labor and a 30-hour week.

At the hearing on the coated abrasives code, labor proposed a minimum hourly rate of 42 cents instead of 36.

A sharp dispute between manufacturers and erectors of metal windows developed at the hearing on the code for that industry, small manufacturers declaring that they were being discriminated against.

At the hearing on the cast iron pressure code, members of the industry who were not members of the Cast Iron Pressure Pipe institute insisted that they be represented on the committee to enforce the code.

Banning of machinery by state governments on construction projects was criticized by J. J. Moore, of the Day & Maddock Co., Cleveland, at the hearing on the code for the construction machinery industry, who said that "if we are prohibited from selling machines we should be prohibited from paying taxes."

The following dates have been set for hearings on codes: Cast iron soil pipe, Oct. 23; cast iron boiler and cast iron radiator industry, Oct. 24; grinding wheels, Oct. 26; buffing and polishing compositions, Oct. 18.

Institute

ONLY K. M. Simpson, deputy administrator, of the three NRA representatives designated to sit in with directors of the American Iron and Steel institute, attended the institute meeting Thursday.

Further commercial resolutions are expected to be released shortly as a result of this meeting.

Considerable pressure has been brought to bear upon the institute to revise resolution No. 13, making delivered prices in Detroit and Michigan on bars, sheets and strip $3 to $5 per ton over the nearest mill bases.

Protests that this resolution discriminates against other districts are numerous, but it is believed that no exceptions will be made because an endless number of concessions would have to be made.

Railroads

EXECUTIVES of the four producers of rails—United States Steel Corp., Bethlehem Steel Corp., Inland Steel Co. and Colorado Fuel & Iron Co.—to the end of last week had not responded to Railroad Co-ordinator Eastman's proposal that they reduce their quotation on rails at least from $40 to $35 in return for contracts totaling 844,525 tons, plus 245,221 tons of fastenings.

In the trade it is reported that a price between $35 and $40 is being considered.

Incidentally, one of these four rail producers—the Colorado company, now in receivers' hands—is being sued by the New York Trust Co. to foreclose properties guaranteeing $39,000,000 in bonds, interest on which was defaulted last Aug. 1.

Labor

WILLIAM GREEN, president of the American Federation of Labor, was re-elected by acclamation Thursday and the entire official lineup of the federation in Washington extended for another year. But just before delegates to the annual convention of the federation returned home they administered a severe rebuff to the Green formula for organizing open shop industries.

Federal unions, of which more than 500 have been chartered by the federation to embrace workers in such mass production industries as steel, automobile, rubber and oil according to plants rather than crafts, are "out."

By an overwhelming vote delegates served notice on their officials in Washington to continue to organize on the horizontal rather than the vertical system. In other words, machinists, electricians and other craftsmen in the steel mills are to be organized as such rather than herded into one big union for each plant.

In the case of some of the larger unorganized industries new craft unions must be set up. Meanwhile, it is expected that the effort to corral unorganized workers will continue, but that the sifting out process into crafts will be started sooner than was originally planned.

A parade of Roosevelt administration officials before the convention emphasized labor's rights under NRA. Said Sen. Robert F. Wagner, chairman of the national labor board: "It may be necessary to set up wage scales for skilled workers to bring their purchasing power to balance with production and rising prices," indicating that NRA might extend its borders beyond fixing minimum wages for common labor.

"The plain stark truth is that you cannot tolerate the strike," declared General Johnson. "If you permit or countenance this economic sabotage public confidence and opinion will turn against you. A minority on each side—industry and labor—is threatening the whole enterprise (NRA)."

Complete unionization of industry was urged last week by Rev. Francis J. Haas, member of the NRA labor advisory board and now also a member of the national labor board, Senator Wagner's organization for mediating labor difficulties. Other new members of the board are Austin Finch, of North Carolina, and Edward N. Hurley, of Chicago, to represent employers in industry, and George L. Berry with Father Haas to represent labor.

STEEL IN THE MOVIES: Jack Holt looks over the deserted mill from whence the striking men have departed. The scene is from Columbia's production, "Man of Steel." The company's cast was "on location" two weeks at a Los Angeles plant

WINDOWS OF WASHINGTON

WASHINGTON

President Swings to 'Right'

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Opposition to NRA Bolder

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Real Purchasing Power Falls

IT IS encouraging for business that the President appears to be veering toward "the right," and the underground railway of gossip has it that this swing will become more pronounced since the American Federation of Labor has re-elected William Green president and returned home.

The "brain trust" is merely a snappy phrase of yesterday, and the bright young men who composed it rarely come around to the White House any more. The President now exposes his mind to such conservatives—comparatively speaking—as Secretary Woodin, Budget Director Douglas and Prof. O. M. W. Sprague, noted financial authority attached to the treasury.

Henry Bruere, grounded in the conservatism of life insurance and the presidency of the largest savings bank in New York, has become the President's official eyes and ears—a sort of domestic Colonel House to check up on RFC, NRA, PWA and other initialed mechanisms devised to combat the depression.

The American Legion, now a year older than when it became impatient with President Hoover at Detroit, recently took almost the identical lecture from President Roosevelt at Chicago, and liked it. Heretofore rabid for the bonus by whatever method paid, the legion rebuffed Rep. Wright Patman, ardent inflationist, and his program of starting the printing presses for its benefit. It stiffened the President's backbone, too, when the American Federation of Labor took its stand against currency inflation.

A sound money bloc is being created in the senate, with Senators Glass and Robinson the rallying point for Democrats and Senator McNary rounding up conservative Republicans for an educational campaign on inflation to head off the firebrands at the January session.

Attorney General Cummings has emerged from his obscurity to allay fears raised at the American Bar association convention when an aide observed that if the constitution conflicted with NRA or other phases of the recovery program the constitution would have to flex. Mr. Cummings has been at some pains to stand by the constitution and the aide has returned to private life.

Bankers coming to Washington recently have been welcomed rather than being held off at arm's length. The RFC and banks are no longer estranged on the matter of RFC purchases of bank preferred stock, while a nearby announcement from the White House is expected to free a substantial percentage of frozen bank deposits.

There are some, it should be said, who believe a group of radical thinkers are closest the President, and who fear the present conservatism is only temporary.

SOME aver that this trend toward conservatism has underlaid the President's program all along, and has just received merited recognition because the thin plating of NRA and PWA has worn off.

In any event, a growing feeling of confidence throughout the country has been reported since it has become apparent that NRA codes are for the long pull of rationalizing industry rather than sweeping it up quickly to complete recovery, and that such prosaic methods as reopening banks, thawing out frozen deposits and stabilizing the currency were reinstated.

Not that any burst of activity in business is looked for this fall; it is believed that steel is typical of industry in that the late summer bulge in production and ordering was anticipatory of late 1933 and possibly also early 1934 requirements, because of threatened higher prices. But the country appears to feel better with President Roosevelt the flagbearer.

During the late summer and early fall, it is conceded, much of the confidence inspired by the President was obscured by the ballyhoo over NRA and PWA. The President's trend toward conservatism is designed to recover the lost ground, and there will be further pronouncements, especially on the currency, with the same objective.

No one can deny that in some subtle fashion the President gave the country fresh courage last March and that this intangible confidence that the worst is past is his greatest accomplishment. The loss of it might yet materialize the Hoover prophecy of grass growing in the streets.

EACH week sees the country regaining its courage and becoming more outspoken in regard to NRA, especially as it affects retail business.

Restaurant keepers at Norfolk, Va., recently pulled down their banners, claiming their costs had been raised beyond all prospect of recompense. In Minnesota, farmers have reversed the process and are boycotting NRA stores because the blue eagle has increased the cost of manufactured products purchased by them, while farm products have remained stationary or declined.

Despite "all the NRA push, the worst winter in America's economic experience is inevitably coming," was the frank statement recently of R. W. Kelson, federal relief administrator in ten New England and northeastern states. Even the President himself said recently "the hardest part is still ahead."

Normally the epitome of regularity, Senator Glass, of Virginia, is refusing to fly the blue eagle on the masthead of his papers at Lynchburg.

Quite a stir has been created in California by the resignation of George Creel, one of Woodrow Wilson's apostles, as regional director of NRA on the ground the centraliza-

tion of authority in Washington leaves nothing for local officials to do. There may be some political reverberations from this.

An industrialist of the caliber of Pierre du Pont, chairman of the E. I. du Pont de Nemours & Co., was bold enough to recommend "less political insistence and domineering attitude" in government plans.

The National Industrial Conference board points out that in the first three months of business upturn that began in April the trend of real wages or purchasing power was upward. Average real weekly earnings increased 6.2 per cent in April, 7.8 per cent in May and 9.6 per cent in June. NRA was officially launched on June 16, the first code approved July 16, the PRA campaign started July 27. In July real weekly wages remained practically stationary, and in August living costs overtook weekly earnings and a decline in purchasing power set in.

As economists have pointed out, the philosophy of NRA is seen to be unsound in that increased wages exacted from industry have been paid to a class of buyers not purchasing capital goods, and hence fail to stimulate the industries most necessary to swift and sound recovery.

Washington is careful to distinguish, however, between the short pull and the long pull for NRA. The ballyhoo that it would put 7,000,000 men to work by early fall has fallen to the ground; the opportunity for industry, through codes, to curb destructive competition and regain a remunerative price level is just being tapped and will exert increasing power over coming months. It may be spring, supposing that business is good then, before the latter effects are realized.

MEANWHILE, codes for the smaller industries and for large groups which have been assembled for the adoption of a master code, with supplemental codes to come later, continue to receive attention.

The legal department is the bottleneck of NRA, hearings being conducted expeditiously and agreements being negotiated between employers and labor on hours and wages, but legal advisers pick over each code with a fine tooth comb, and in some instances several weeks delay ensues.

Apparently anticipating a contingency, most industries are standing firmly on the inclusion of the so-called merit clause in their codes. Just as regularly as codes come up to him with the clause inserted, the President strikes it out and leaves only a restatement of section 7A of NIRA remaining.

Typical of the lack of co-ordination between the legal department and deputy administrators, when the malleable iron code was under consideration 10 days ago Deputy Administrator King took exception to certain provisions which, it developed, had been inserted upon the authority of the legal department itself!

There has been frank discussion lately of the future of NRA, the effort of the President to reconstitute the federal trade commission lending some color to report that the enforcement of codes would ultimately be lodged there. A good deal of speculation also is to the effect that Gen. Hugh S. Johnson, now administrator, will retire shortly.

Although no official announcement has been made, tentative plans within the NRA organization for a permanent setup call for four assistant administrators, understood to be K. M. Simpson, who handled the steel code, Malcolm Muir, Gen. C. C. Williams and Arthur D. Whiteside.

To Mr. Simpson would go steel, coal and most of the minerals; to Mr. Muir, construction, machinery, lumber and allied materials; to General Williams, chemicals, leather, etc.; and to Mr. Whiteside, various trades and services including the retail codes.

WITH the President turning out William E. Humphrey, Republican member, and other members of the commission taking official action to bar him, the federal trade commission is ably maintaining its reputation of being the stormy petrel of the independent government services.

Only after President Wilson's proposal was emasculated in congress was the commission first set up in 1914, his hopes for an agency to protect small industry being confused later with the narrow scope actually permitted by congress.

During the war the commission functioned partially as an aide to control and allocation groups.

The war over and the senate endeavoring to heckle business, the trade commission in 1920 undertook to compile cost data and seized upon iron, steel and coke as its first victim. In the ensuing Claire Furnace cost reporting suit the commission won a Pyrrhic victory and the attempt was abandoned.

At about the same time the commission, glad to have the complaint of the Western Association of Rolled Steel consumers, of Chicago, embarked on its hearings which ultimately resulted in the abandonment of the Pittsburgh basing point system for steel in July, 1924.

During the Hoover administration the commission inaugurated a campaign for fair trade practices in many industries—in some ways anticipating NRA—but the strength to hold entire industries in line was lacking.

New life was injected into the commission at the last session of congress when it was given the enforcement of the securities act, a measure drafted with more zeal than practical knowledge and which has practically snuffed out the issuance of new securities. Some loosening of restrictions is believed certain at the coming session of congress.

In place of Mr. Humphrey, first appointed by President Coolidge and now with five years of his re-appointment by Mr. Hoover to serve, President Roosevelt has named George C. Matthews, a progressive Republican from Wisconsin, and a member for many years of the Wisconsin public utility commission, which achieved a reputation for sponsoring consumers' rights.

Another new member is Prof. James M. Landis, of the Harvard Law school, succeeding Raymond Stevens, who departs in peace at the end of his term. Other members of the commission are Charles H. March, new chairman, Garland S. Ferguson Jr. and Ewen L. Davis, brother of Norman H. Davis, international handyman for the President.

Plane Gets an Assist!

THE World series may be over, but a double play in the transportation field occurred last week when Carnegie Steel Co.'s Ohio river tow boat DUQUESNE *broke a wheel shaft near Memphis, Tenn.*

Carnegie's marine department at Pittsburgh was immediately notified. A spare wheel shaft was located, dispatched overland on a truck. The truck sped south from Pittsburgh, headed for Memphis. But in southern Ohio the truck broke down.

In the meantime, the DUQUESNE *lay waiting at Memphis, helpless to proceed to Pittsburgh where its tow of six barges loaded with Louisiana sulphur was wanted by the company's Pittsburgh steel mills.*

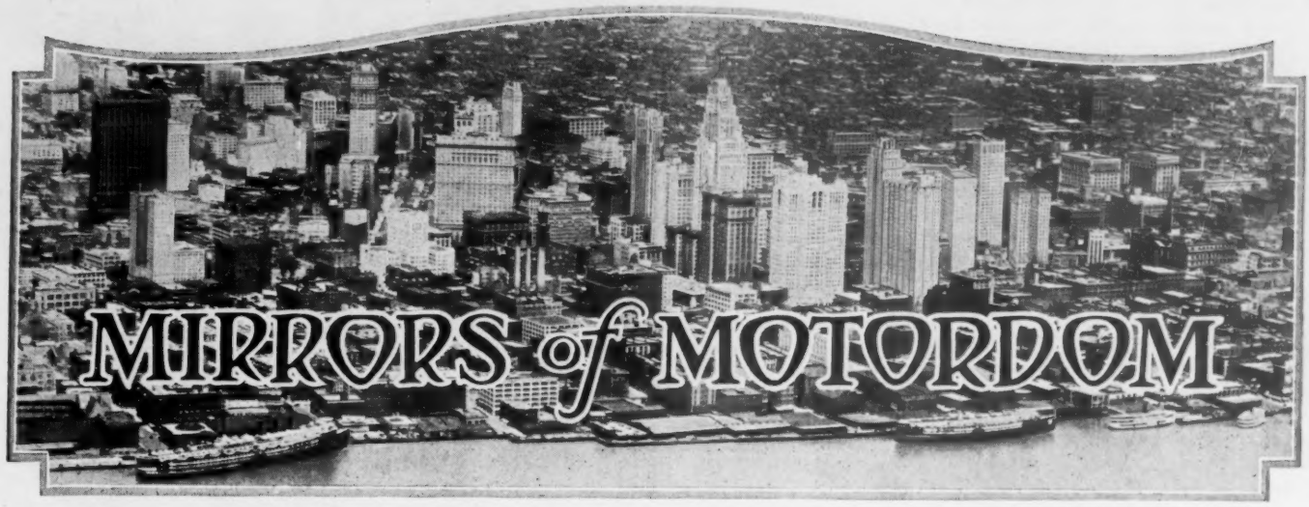
Next, an airplane was resorted to. The plane left Pittsburgh with truck parts for the stalled truck. The truck was repaired and proceeded with its heavy spare shaft. A few days later the DUQUESNE *left Memphis.*

Talks to Founders on Rays

Robert F. Mehl, director of the metals research laboratory, Carnegie Institute of Technology, Pittsburgh, will speak on "Detecting Defects in Castings by Means of X-rays and Gamma-rays" at the first regular meeting of the 1933-1934 season of the Pittsburgh Foundrymen's association, Pittsburgh, on Oct. 16 at the Carnegie Institute of Technology.

Big Turbine Order Placed

General Electric Co., Schenectady, N. Y., has booked an order from the navy for turbines to cost about $2,500,000.



DETROIT

AS AUTOMOBILE manufacturers perfect their plans for independent mounting of front wheels, whereby the front axle is eliminated and coil springs supplant leaf ones, it becomes evident that steel requirements in the aggregate will vary little through this change, which apparently will be the major mechanical one for 1934.

Forging bars lose a market that has been a standby and a steadily expanding one for 30 years; carbon and alloy bars, according to the specifications of individual manufacturers, and strip will gain real tonnage. First releases of these materials have been made, and in at least one instance fabrication of the new parts has been started.

The method of mounting these springs will differ widely, but the chief variation in the springs themselves, of which there will be one for each front wheel, will be in their size, which will be governed by the weight of the car. One automobile maker is specifying SAE 9260, a silico-manganese steel, a second SAE 1370 and a third straight carbon steel.

For a car the size of Buick the diameter of round bars formed into coil springs is about 23/32-inch, and the length about 13 feet. The specifications set up by all prospective users of coil springs are exceedingly rigid and tolerances are as narrow as 0.002-inch. The process of manufacture is to grind the billet, hot roll the bar, centerless grind the bar, heat the bar and form the coil, then heat treat it.

Front axles, which will disappear entirely in the new arrangement, weigh 43 pounds in the case of Plymouth and Dodge, 48 in Olds, an average of 52 in Buick, 38 in Pontiac and Chevrolet, and 31 in Ford. For a car of the Plymouth class each of the coil springs will weigh 14 pounds. In the larger Buick the new coil spring will weigh almost 20 pounds. Also displaced by the new coil springs are the present semi-elliptic leaf springs, which for a car of the Plymouth class weigh about 18 pounds each.

New Springs No Steel Loss

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Ford May Make Own Steel

• • •

Fear Auto Sales Rob 1934

However, as an offset to the elimination of front axles and leaf springs, which weigh much more than the new coil springs, are the strip steel housings for these coil springs; arresters within the housings which function as shock absorbers; reach rods to the frame, which in some cars will be dierolled; and considerable strengthening of the frame itself. One important series of cars will probably go to a heavy tubular frame; the side rails of another will be virtually box girders.

It is believed that all General Motors cars will have their front wheels independently mounted in this manner, while Cadillac-LaSalle may also revise its rear wheel mountings. Ford is reported contemplating this new suspension for all four wheels. Chrysler is expected to have the new mountings at least on the front wheels of all its lines. Practically all other manufacturers are weighing the effects of such a change.

In the case of independently mounted rear wheels, the differential housing apparently will be fixed, with one or more universal joints in the axle shafts. A stationary differential housing would permit a rigid drive shaft and enable bodies to be hung lower, inasmuch as no allowance need be made for vertical movement of the differential.

Cord faced virtually the same problem with its front wheel drive, its differential being a unit with the engine and two universal joints being required to compensate not only for vertical movements of the axle shafts but also for steering.

A "softer" ride is claimed as the main objective of the new spring mounting, with more benefit accruing to passengers on the rear seat than the front. Engines will be mounted farther forward in the frame. No matter at what angle the front wheels may be, the body will remain practically horizontal. Bodies will tend more to glide forward than to bob up and down.

SOME delay in getting dies and tools for new 1934 models still is being experienced by some manufacturers and actual assemblies of the new models will start later than planned, but the worst of the die and toolmakers' strike is over.

In some independent shops and in die and tool divisions of some automobile manufacturers the ultimatum to strikers a week ago to return for work or for tools was effective. Despite strong picket lines, a number of small shops are again operating.

However, a number of automobile manufacturers have removed their original dies and tools and placed their business elsewhere.

Shops in Dayton, O., Philadelphia, Chicago, Milwaukee, Cincinnati, Cleveland, Indianapolis, Providence, R. I., and Kenosha, Wis., have benefited. The result is that there is comparatively little work now for the strikers to return to and they have thrown away the first opportunity for real employment in a year. The financial problem of die and tool shop owners is correspondingly aggravated.

Organizers for the American Federation of Labor and for some radical organizations continue to try to sign up automobile workers, the objective apparently being to tie up plants when they resume in November and early December on new models. Most automobile plants, however, are well organized internally. Chrysler last week adopted a liberal employe representa-

tion plan. General Motors has had such a plan operating for some time.

While treating their employes generously, observing the code regulations for an average work-week of 35 hours and paying common labor as much as 25 per cent above the code minimum, the automobile industry has been firm to the extent of impressing workers with the fact that if they go out on strike they forfeit all rights to their jobs.

One supplier in the Detroit district, where organization was proceeding rapidly, has been hiring just enough new men each day to keep a large group of unemployed around its gates; the sight of men anxious to work appears to have quelled any desire to walk out on the part of men within the gates.

In many automobile plants there has been a gradual weeding out of radicals, one test being naturalization of foreigners. Apparently automobile payrolls will shortly carry the names of few aliens who have been in this country long enough to apply for their papers and have neglected to do so.

Detroit would not be surprised if Henry Ford shortly closed his entire Fordson plant for a brief period; one report was that this would be done beginning this week. It will be recalled that last February Mr. Ford closed his entire plant suddenly when labor difficulties threatened, and the shutdown afforded an opportunity to weed out undesirables.

There is some reason for believing that the hiring of 5000 members of the American Legion a few weeks ago was not so much to increase the staff at Fordson as it was to place unqualifiedly loyal Americans in strategic positions in the Ford plant to check radical propaganda.

There has been some gossip that the New York automobile show, usually opening the first week of January, might be postponed. The delay thus far in getting under way for 1934 has not been serious enough for that.

FALL sales of automobiles superficially indicate an exceptionally strong retail situation for the season, but executives in Detroit are beginning to wonder if these sales have not robbed the market for late 1933 and early 1934.

Automobile salesmen apparently have driven home many wavering sales by emphasizing the probability that f.o.b. prices on 1934 models will be higher on account of increased material costs, while trade-in values will be limited by the new automobile dealers' code.

It probably is true that trade-in values will be less. But f.o.b. prices apparently will not vary greatly. Of the two new lines brought out thus far, Packard has increased an average of $200 per car, while Studebaker has imposed reductions from $150 to $280. Indications are that any price advances, especially in the low-price field, will be smaller than seemed probable three months ago.

Just as retail sales appear to have robbed the future, so the exceptional stocking of raw materials has robbed these markets. By the end of last week, when shipments on third quarter contracts officially were completed, more steel was under roof at Detroit than at any time since the palmy days of 1929.

Releases against fourth quarter contracts accordingly have been negligible, and while they will develop, especially for sheets and strip as new models are put into production, shipments to Detroit this quarter will be far short of actual consumption.

Confirming the report in this column several weeks ago that Henry Ford was threatening to reopen his steelworks rather than pay higher prices for bars and other products that he can produce at Fordson, an informal inquiry for 10,000 tons of basic iron has been put out, and four open-hearth furnaces are being warmed up.

Recent trades of Ford pig iron for steel from a Cleveland mill have virtually depleted the stock of basic iron at Fordson. While Ford continues to sell open-hearth scrap, recent production has left a comfortable stock on hand.

The matter of costs will govern, of course. Regardless of how stiff the advance in steel prices is, Ford executives will scrutinize not only the open market price for basic iron but also the cost of converting it. The possibility that one of the two Ford blast furnaces will be relighted is also present. The Ford steelworks, consisting of 10 open-hearth furnaces and two blast furnaces, has been cold for more than a year.

FORD production has eased off to 1500 units a day, five days a week, for one reason because dealers' stocks are large. Future operations at Fordson appear in delicate balance. Late last week, as previously noted, there was the possibility that a complete shutdown might become effective this week.

Several weeks ago it was believed that a late October shutdown would be the opportunity for some retooling in preparation for changes in the present series, especially the independent mounting of wheels. Nothing on the surface, however, indicates the immediate introduction of the much-heralded lower price job.

Ford has definitely fixed Oct. 21-28 as the dates for the 30-year pageant of progress exposition in convention hall, Detroit. Leading parts manufacturers will depict the progress made in automobile design since 1903, the year the first Ford was put out. The promotional campaign to be put on by Ford will be the largest by that interest in several years.

Daily production rates become meaningless at this season, because of the changeover to new models. Chevrolet, for example, continues to assemble the 1933 line, but parts for the steering mechanism for the 1934 series are being put under production and other departments which are far ahead of the assembly line are down for inventory. Volume production of parts for the new Chevrolet and Pontiac begins next month.

Chrysler is going through October on a schedule little changed from September. Its Dodge line is showing great vitality, sales now exceeding those of its competitors, including an eight in its price class. Hudson-Essex is practically through with its run on 1933 cars, and is in the transition stage to its 1934 series. Retail sales of Hudson-Essex in the week ended Oct. 7 were the largest for early October in four years.

Nash, now bringing out its 1934 lines, has gone farther than any Detroit manufacturer in the way of streamlining wheels. Nash rear wheels are enclosed in "pants" in much the same manner as airplane landing gear. Chrysler, on the other hand, is probably not going in for valances this year, though continuing to leave little clearance between wheels and fenders.

Remodeled Stack Blown In

Globe, remodeled blast furnace of the Globe Iron Co., Jackson, O., was blown in Oct. 2 and now is operating efficiently. J. R. Comstock, formerly with Hanna Furnace Co. and more recently in an advisory capacity on engineering work in Russia with Freyn Engineering Co., is superintendent-in-charge. George F. Bertsch, long identified with Globe Iron Co., is assistant superintendent and chief chemist. A. H. Dierker, late senior metallurgist research engineer, Ohio State university, is research metallurgist. In addition to its ordinary grades of silvery, bessemer ferrosilicons and special silicon manganese alloys, the company is conducting research on the production of other special alloys for use in making steel and castings.

Cut Bases, Add Extras

A readjustment in corrosion and heat resisting alloy steel prices results in somewhat lower bases but adoption of quantity extras leaves the net price to the buyer little changed. The new prices are quoted on page 46 of this issue.

Steel Rate Up 2 Points to 40%; Drop Likely This Week

FOR the first time since the third week of July, steelmaking operations increased last week, rising 2 points to 40 per cent, because of the rush of mills to complete shipments against third quarter contracts by Oct. 15. The most marked advance was in the New England and Wheeling territories, the latter benefiting as the strike at Weirton ended. This week, continuation of the downward trend seems likely to be resumed, as mill order books are depleted. Details for various districts follow:

Chicago

Ingot production rose 1 point to 49 per cent last week, the best rate in about two months. Lacking the support of backlogs, however, future trend of schedules is uncertain. Better steelmaking engagement has necessitated lighting another blast furnace, 11 steelworks stacks now being active here. This is four more than a month ago. Seven Steel corporation and four independent units are in blast.

Cleveland

Steelworks operations in the Cleveland-Lorain district for the week ended Oct. 14 averaged 46 per cent, down eight points from the preceding week. Corrigan, McKinney Steel Co. had on four of its 14 open hearths; Otis Steel Co. six of its eight, reductions in both instances from the preceding week. The National Tube Co., Lorain, added one unit, operating eight of its 12 units.

Youngstown

Steel output in the valleys was up 2 points last week to 57 per cent, highest since the third week of August, with this rate expected to hold this week. At the start of this week 3 out of 4 bessemer converters and 51 out of 83 open-hearth furnaces were operating.

Pittsburgh

Steel ingot schedules confirmed the anticipated 2-point advance for last week and averaged 40 per cent. For this week, a decline of as much as five points to 35 per cent for the district is not unlikely. The expected decline through this week, however, will be a gradual one as it was physically impossible for steel producers to have cleaned up shipments on third quarter contracts by the Oct. 15 deadline. Considerable business of this nature will be rolled this week.

The number of active steelworks blast furnaces in the district is holding, with 17 out of 53 in blast. Carnegie operates 9 out of 32, Jones & Laughlin 4 out of 11 and National Tube, Monongahela, 1 out of 4. Of the two stacks each owns, American Steel & Wire at Donora, Pittsburgh Crucible at Midland, and Pittsburgh Steel at Monessen each are blowing one furnace.

Buffalo

Rapidly fluctuating operations make forecasts of production difficult, but indications point to a 32 per cent rate of steelmaking this week, a gain of 3 points. Tentative schedules, subject to last minute revision, call for 12 open hearths to be in production, one less than the peak of operations last week.

Birmingham

Off 4 points, steel operations here averaged 30 per cent last week, with little change indicated for this week. This 4-point drop reflects slightly easier demand.

Wheeling

Steelmaking schedules regained 10 points last week and averaged 45 per cent. Open-hearth furnaces at Weirton Steel Co. got under way Oct. 10, although another large producer in the district took off an open hearth, so only 15 of 37 furnaces were operating. Plans were under way to resume blast on Oct. 13 on the two Weirton blast furnaces which have been banked since Sept. 27. Coke oven operation there was also to resume late last week.

Eastern Pennsylvania

Steelmaking operations in the central eastern seaboard district are down 5 points, to 26 to 27 per cent, with incoming specifications light. Unless railroad buying develops in material volume, the outlook for improvement over the next several weeks is not good, steelmakers declare. The present rate is the lowest since the second week of June, and the first time since late June that the rate for this district has broken through 30 per cent.

New England

Ingot operations in New England last week were near full capacity, with all open hearths on, at 95 per cent, a gain of close to 20 points. Indications are operations this week, starting Oct. 16, will hold. The increase is due largely to efforts to complete shipments against old contracts.

Detroit

Great Lakes Steel Corp. is now operating all six open hearths, lifting this district's steel rate from 45½ per cent to 55. Ford Motor Co. is warming up four open-hearth fur-

Operating Rate of the Steel Industry, by Weeks

All figures except monthly open-hearth and bessemer totals of American Iron and Steel institute are percentages, based on reports from Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Buffalo, Wheeling, New England, St. Louis, Lorain, Detroit districts. STEEL's weekly estimates take into account only actual available capacity. Whether a week is the first or last of a month is determined by the month into which a majority of its days fall.

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	STEEL's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.....	22	25	26	27	28.5	25.7	1,484,991	26.41
Feb.....	28.5	27	25	25	....	26.4	1,481,253	27.40
March....	25	25.5	24.5	23	....	24.5	1,433,337	24.55
April.....	23	22	22	23	24	22.8	1,259,629	22.40
May.....	24	24	25.5	23	....	24.1	1,125,243	20.01
June.....	21	17	17	17	....	18.0	912,757	16.23
July.....	14.5	12	15.5	16.5	16.5	15.0	806,722	14.92
Aug.....	14.5	14.5	15.5	14.5	....	14.7	846,730	14.50
Sept.....	13.5	15.5	15	17	....	15.3	991,858	15.64
Oct.....	18	19	19.5	19.5	19.5	19.1	1,087,058	19.33
Nov.....	21	21	19	17.5	....	19.6	1,032,221	18.36
Dec.....	16	15	14	12	13	14.0	861,034	15.31
1933								
Jan.....	15.5	17	18	19	....	17.4	1,030,075	18.23
Feb.....	19	19	19	17	....	18.5	1,086,867	20.83
March....	15	13.5	15	14	15.5	14.6	909,886	15.50
April.....	17.5	20.5	25	29	....	23.0	1,362,856	25.08
May.....	33	36	40	43	....	38.0	2,001,991	34.11
June.....	47	48	49	51	54	49.8	2,597,517	45.96
July.....	55	57	57	55	....	55.8	3,203,810	58.95
August....	54	54	51	48	45	50.6	2,900,611	49.42
Sept.....	42	41	40	38	....	40.9	2,310,982	40.89
Oct.....	38	40	..	..	....	....	.....	.....

naces and inquiring for basic iron, but the final decision to operate has not yet been made. It has much foundry iron and scrap in stock, but little basic iron.

American Rolling Mill Co. Now Offers Stainless Steel

American Rolling Mill Co., Middletown, O., will manufacture and distribute stainless steel sheets, strip and plates, this action culminating long experimental work.

Two grades will be offered, Armco 17 for automobile parts, furnace parts, nitric acid and oil refining equipment and oil burner parts; and Armco 18-8 for airplane parts, restaurant and kitchen equipment, laundry and dairy machinery, beer barrels and similar uses.

A stainless steel sales department has been created with J. P. Butterfield, formerly manager of the development department, in charge. E. E. Jones is assisting him.

Production in the different plants will be supervised by Ralph E. Curry and W. L. Woodward, both assistants to the vice president in charge of operations. Sales will be handled through the company's district offices.

Organize National Screw Machine Products Group

National Screw Machine Products association has been organized by manufacturers of products which can be made on single or multiple spindle automatic or hand screw machine equipment. At the recent organization meeting 146 manufacturers were represented. The association is cooperating with the Fabricated Metal Products Federation and is operating under the latter's code until its own supplemental code is adopted.

Officers of the association are: President, David Bell, David Bell Co. Inc., Buffalo, vice president, George Briggs, Screw Machine Products Corp., Providence, R. I.; secretary, C. C. Heath, Brown-McLaren Co., Detroit, treasurer, E. A. Schneider, Hudson Screw Machine Product Co., Chicago.

Sell Hausman and Wimmer

Scrap-yard machinery and other equipment as well as all remaining physical assets of the Hausman & Wimmer Co. were disposed of at a public sale Oct. 10, conducted at Midland, Pa. Assets were disposed of piece-meal among some 15 purchasers. The total of bids piecemeal exceeded that of the Pittsburgh Crucible Steel Co. at $6800 for the total property, and the latter bid, therefore, was rejected.

Died:

HUGH BRYSON WICK, 63, in Cleveland, Oct. 8. He was chairman of the board of Steel & Tubes Inc. when it consolidated with the Republic Iron & Steel Co. in 1928, and he retired. He was born in Youngstown, O., son of the president of the Ohio Steel Co., now part of the Carnegie Steel Co. He and his father subsequently established the Elyria Iron & Steel Co., Elyria, O., for rerolling rail steel. The company established plants at Toledo, O., Cleveland, and Guelph, Ont. It acquired patents rights for welding steel tubes electrically, and in 1915 the name was changed to Steel & Tubes Inc. Hugh B. Wick succeeded his father as president. In 1927 he became chairman, and was succeeded as president by his younger brother, Myron A. Wick, until the company was absorbed by Republic.

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Stewart Henry Chisholm, 86, once a leader in the steel industry at Cleveland, in that city, Oct. 8. Born in Montreal, Que., and migrating to Cleveland with his father, his first employment was with Stone, Chisholm & Jones, in which firm his father was a partner, and which later was merged into its subsidiary, the Cleveland Rolling Mill Co. He became vice president of this company, and 1898 joined with John W. Gates in organizing the American Steel & Wire Co. He also organized the H. P. Nail Co., Cleveland, named for Huggett's patent, originally manufacturing horseshoe nails, but later one of the largest wire nail plants in the country. He was one of the organizers of the Chisholm & Moore Co., manufacturing chain hoists and malleable castings, and several other manufacturing companies, retiring in 1900.

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William S. Poling, 68, owner of the Poling Wire & Fence Co., Anderson, Ind., in that city recently.

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Peter L. Wethe, 51, civil engineer employed by the Illinois Steel Co., Chicago, in that city, Oct. 7.

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Kenneth E. Blair, 44, assistant superintendent, Erie Forge & Steel Co., Erie, Pa., in that city. Oct. 6.

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Hans O. Egeberg, chief employment officer, Gary, Ind., works of the Illinois Steel Co., in that city recently.

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John J. Gartshore, 84, president, J. J. Gartshore Ltd., Toronto, Ont., dealer in railroad equipment, in that city, Oct. 9.

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Robert F. Stengel, 59, founder and president of R. F. Stengel & Sons, sheet metal contractors, New York, in that city, Sept. 26.

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Joseph J. Goddard, for many years one of the owners of the Southern Boiler Works, Mobile, Ala., in that city, Sept. 30.

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Charles W. Kirsch, 66, chairman of the board, Kirsch Mfg. Co., Sturgis, Mich., hardware, at his summer home, Klinger Lake, Mich., Sept. 14.

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James C. Burt, 69, president, Burt Foundry Co., Toledo, O., in that city, Sept. 26. He founded the company 20 years ago, now managed by his son, Reeve.

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N. D. Stewart, 60, president, Moline-Stewart Co., manufacturer of farm implements, at his home in Harlingen, Tex., Oct. 10. He resided in Atlanta, Ga., 12 years, but moved his offices to Texas two years ago.

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Harry H. Elmer, 65, former general manager, Globe Malleable Iron & Steel Co., Syracuse, N. Y., in that city. Failing health forced his retirement from business in 1927. He was the inventor 11 years ago of an oil engine which won him fame and a substantial fortune.

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William C. Letchworth, 77, former general manager, Acme Steel & Malleable Iron Works, Buffalo, in that city, Oct. 10. He formerly was associated with his father, Edward H. Letchworth in the operation of Pratt & Letchworth, Buffalo. He retired in 1923 and devoted himself to world travel.

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E. M. Evarts, 45, secretary, Turl Iron & Car Co., New York, in Pawling, N. Y., Oct. 11. As a lawyer he specialized in patent work and represented the alien property custodian in seizures of enemy-owned patents during the World War. He was associated with several other industrial companies in New York.

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Aaron Mendelson, Detroit capitalist, in that city, Sept. 23. He and his brother, Louis, were the financial backers of the Fisher brothers when they went to Detroit to establish an automobile body plant, and he was secretary, director and member of the executive committee, Fisher Body Corp. in 1926 at the time of its merger with the General Motors Corp.

Explains Welded Connections

Adaptable types of welded connections for buildings will be discussed by Gilbert D. Fish, consulting engineer, before the local chapter of the American Welding society, Oct. 16, Engineers club, 1317 Spruce street, Philadelphia.

Industrial Men in the Day's News

HERBERT C. RYDING, since 1894 connected with the iron and steel interests now comprehended in subsidiary companies of the United States Steel Corp., and since 1907 with the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., retired Oct. 15 under the corporation's pension plan. A native of England, he was educated in Germany and entered the steel industry through a company in South Wales. After working in mills at Birmingham, Louisville, Ky., Johnstown, Pa., and Lorain, O., he went with the Tennessee company and became its president Feb. 1, 1930.

Succeeding Mr. Ryding as president of the Tennessee company is Robert Gregg, who has been vice president since Aug. 1, 1932, and who previously was with the Atlantic Steel Co. Mr. Gregg is 48, a native of Atlanta, Ga., and a graduate of Cornell university. Becoming identified with the Atlanta Steel Co. in 1908, he continued with it and its successor, the Atlantic Steel Co., until Aug. 1, 1932, when he became vice president of the Tennessee company. Mr. Gregg's career was sketched in STEEL for Aug. 1, 1932.

Robert Gregg

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Ray S. Fox, formerly pig iron sales agent for Cleveland-Cliffs Iron Co., and John Daker, formerly with the Cleveland office of Semet-Solvay Co., have organized R. S. Fox & Co., with offices at 608 Keith building, Cleveland, as agents for the sale of pig iron, coke and alloys.

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Fred E. Wolf has been appointed sales engineer for New England territory by the Pangborn Corp., Hagerstown, Md., manufacturer of sand blasting and dust collecting equipment. His office is at 19 Orchard terrace, Arlington, Boston. He has had 18 years engineering and sales experience with the company, and was manager of its Pittsburgh office more than ten years.

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Stuart Dean, president, Dean Bros. Co., Indianapolis, pump manufacturer, was elected second vice president of the Indianapolis Rotary club at the annual election recently.

Mal E. Howe, sales manager in Indiana for the American Can Co., was elected secretary of the club.

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L. F. Johnson, who has been in charge of sales in Chicago since 1931 for the Ohio Ferro-Alloys Corp., Canton, O., has taken new offices at 1426 Conway building, Chicago. He will continue to handle the company's sales, including ferrochrome, ferrosilicon, silicomanganese and ferromanganese.

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Edward B. Winning has been appointed manager of northern coal mines, Republic Steel Corp., Youngstown, O., succeeding George H. Morse who has become vice president and general manager of the Union Collieries Co. Mr. Winning's headquarters are in the Fayette Title & Trust building, Uniontown, Pa.

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Malcolm C. Kneeland, formerly assistant manager of the Lincoln plant, United Engineering & Foundry Co., Pittsburgh, has joined the Pittsburgh Steel Foundry Corp., Glassport, Pa., as manager of iron roll production. He was with the United company in its Lincoln plant, Pittsburgh, from 1913 until 1931, when the plant was consolidated with the company's Canton, O., works.

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Frank F. Slick, for the past five months acting general superintendent of the Edgar Thomson works, Carnegie Steel Co., Pittsburgh, has been appointed general superintendent. He has been in the employ of the Carnegie company continuously since March 1, 1896.

John Lloyd, superintendent of the rolling mill, has been appointed assistant to Mr. Slick. He joined the Carnegie company in May, 1899.

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George B. Ingersoll, who retired recently as assistant general manager of the Beloit, Wis., works of Fairbanks, Morse & Co., after an association of 32 years, has been elected city manager of Beloit. He was born in Beloit in 1867, was graduated from Beloit college in 1889 and from the University of Wisconsin in 1893.

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J. E. Maloney, of Cleveland, has been appointed in charge of frame and heavy stamping sales for the Murray Corp. of America, Detroit. Mr. Maloney formerly for 11 years was general sales manager of the Midland Steel Products Corp. Appointment of Mr. Maloney, it was said at the Murray offices, presages an increase in activity in the frame and heavy stamping end of the Murray business. Manufacturing of these products is carried on at the Ecorse, Mich., plant, which adjoins the Great Lakes Steel Corp. Mr. Maloney has had a number of years experience in the frame and heavy stamping business in manufacturing, engineering and sales. Prior to his association with Midland Steel Products Corp., Mr. Maloney was with the Hydraulic Pressed Steel Co., Cleveland, for a number of years.

J. E. Maloney

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C. Lorimer Colburn, who resigned as secretary of the Colorado Metal Mining fund, has opened an office as consulting engineer, 509 Seventeenth street, Denver.

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R. L. Foote has been appointed special sales engineer by the Synthane Corp., Oaks, Pa., to specialize in roll neck bearings.

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Thomas F. McLaughlin, general manager for several years of the Baltimore works of the Rustless Iron Corp. of America, has been elected vice president in charge of opera-

(*Please turn to Page* 56)

EDITORIAL

After Twenty Years—Uniform Extras for Steel Industry!

ABOUT 20 years ago, at one of the early meetings of the American Iron and Steel institute, four steel company executives then active in the marketing of iron and steel products participated in a symposium on "Extras, the Reason and Necessity Therefor."

The contributors to the discussion were J. Leonard Replogle, then of Cambria Steel Co.; Henry P. Bope, Carnegie Steel Co.; John L. Haines, Jones & Laughlin Steel Co.; and Charles R. Robinson, Lackawanna Steel Co. All of these speakers emphasized three fundamentals:

1. That extras should be a legitimate increase over the base price and should represent only the increased cost over what are regarded as standard sizes, qualities or grades.
2. That extras should be uniform throughout the industry, and
3. That extras should be levied upon all sales of all products where extras apply, without fear or favor or discrimination. In fact, Mr. Haines concluded his discussion with this apt couplet:

"Prices may rise and prices may fall.
Extras should stand like the Chinese Wall"

Anyone familiar with the conditions existing at the time the foregoing discussion took place and with conditions in the past few years, knows that in the interim of two decades the industry has made considerable progress in the refinement of extra cards. Particularly since the world war, much conscientious effort has been expended in revising obsolete extras, in re-establishing base prices to keep pace with changes in practice and in striving for uniformity in extras as applied by the various companies.

Extras Refined and Improved in Last Two Decades, but "Waiving" Still a Problem

In spite of this noteworthy progress, the industry still was cursed with one practice which unfortunately tended to offset the benefits of refinement, uniformity, etc. This was the practice of "waiving" extras in time of acute competition. Naturally the practice was indulged in more and more as the pressure of the depression increased in the lean years of 1932 and 1933.

To the great credit of the steel industry, be it said that when its leaders were called upon to draft a code of fair competition, they did not stop at creating a pact which would meet the bare requirements of the recovery act, but also assumed the heroic task of writing new rules for the marketing of iron and steel products. They issued clear-cut regulations for determining base prices and then dealt specifically with extras. Section 7 of Schedule E provides that

"Except as in this Schedule E . . . otherwise provided, any extras added to and any deductions made from the base prices of any product sold by any member of the code in determining its quoted and billed price for such product shall be uniform for all members of the code. The rates of such extras and of such deductions shall be those approved from time to time by the board of directors."

In according with this provision, the institute's committee on commercial matters, headed by S. E. Hackett, Jones & Laughlin Steel Corp., has been working for weeks on the compilation of an "official" list of extras and deductions. On Sept. 20 the work of the committee was approved by the board of directors of the institute and last week the institute's book "Uniform Extras and Deductions for Products of the Iron and Steel Industry under the Code of Fair Competition" was issued.

NRA Offers Opportunity for Uniformity; Steel Industry Acts To Cure Old Abuses

The book contains the official extra cards for 70 iron and steel products, ranging from pig iron and semifinished steel through the common forms of finished steel to specialties such as magnet steels, jail steels, cutlery steels, etc. Each product is designated by a section number and the book is arranged in loose-leaf form so that additions or revisions may be inserted easily.

No one will claim that the publication of this book marks the final solution of the problem of extras. Additions, revisions and deletions may be expected as buyers and sellers find defects through actual experience. The very existence of the official list will stimulate refinement, simplicity and improvement. This urge, combined with the specific rulings of the code, should go far in enabling the industry to fulfill the requirements of the three fundamentals prescribed by its spokesmen 20 years ago.

The industry and every individual who participated in the work are to be congratulated upon the execution of this gigantic task of compiling standard extras. It is the vehicle by which the industry may solve, if it chooses to do so, a problem which in recent years has caused the loss of millions of dollars unnecessarily. Also it must be remembered that while NRA provided the opportunity, it was the industry's will and courage which made the achievement possible.

THE BUSINESS TREND

Business More Philosophical Toward National Problems

WHILE annoying factors are no less plentiful today than at any time in the last 10 weeks of business uncertainty, sentiment is slightly improved.

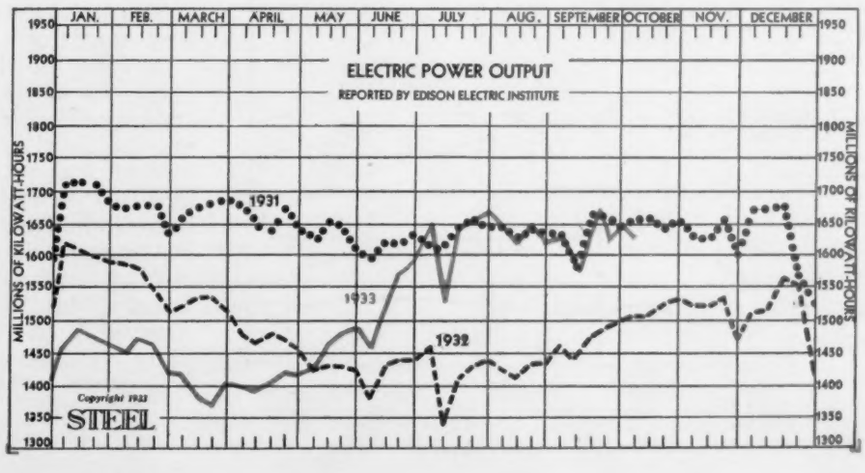
This may be traced partly to the signs of an impending change in the trend of important barometers of industrial activity and partly to a more philosophical view of the final outcome of government activities in business.

The record of business still is unsatisfactory, especially if viewed from a short term perspective. However, when examined in the light of a 12-month experience, it is rather encouraging. Steel ingot production in September was at 40.89 per cent of capacity, a drop of 17 per cent from August. Yet the 40.89 per cent compares with 17.64 per cent in September, 1932. Moreover, the total output in 9 months of 1933 is 17,404,595 tons, which is 130 per cent of the output of 13,322,833 tons for the entire year of 1932!

The decline of the backlog of orders of the United States Steel Corp. on Sept. 30 to the lowest point on record is not particularly significant insofar as comparisons with previous months are concerned. The effect of the NRA code on the method of specifying against purchase orders virtually places the unfilled order barometer on a new basis. Heretofore the monthly figures included tonnage which never actually was specified. Henceforth, as long as NRA rules obtain, the figure should more closely approximate tonnage booked for actual delivery.

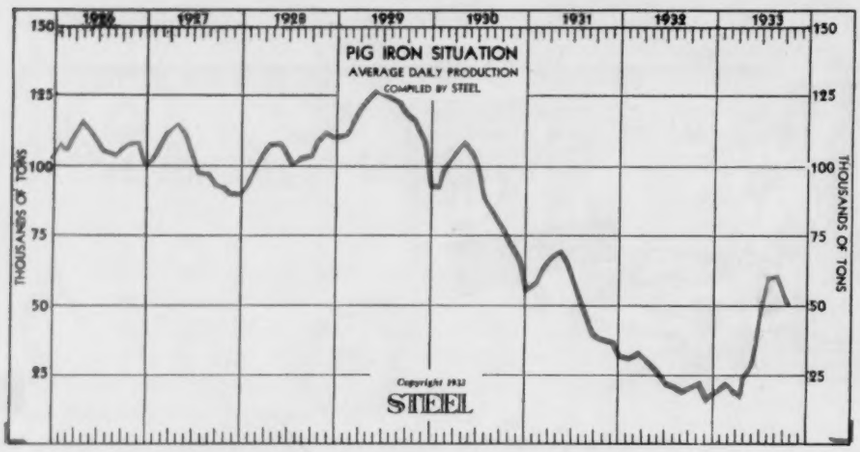
Fears of Acute Strike Trouble and Wild Money Policy Calmed by Recent Events

The force of public opinion, aided by belated utterances from the government, is quieting the strike menace. The appointment of Henry Bruere as co-ordinator of credit has calmed some of the fears of sound money advocates. These and other developments are inducing industrialists to take a more philosophical attitude toward the apparent difficulties of the government's recovery program. Again we remind readers that the bark of those who at times seem to be working against the interests of industry is worse than their bite.



1933	Million Kw.—Hr.
Oct. 7	1,646
Sept. 30	1,652
Sept. 23	1,638
Sept. 16	1,663

1932	Million Kw.—Hr.
Oct. 8	1,506
Oct. 1	1,499
Sept. 24	1,490
Sept. 17	1,476



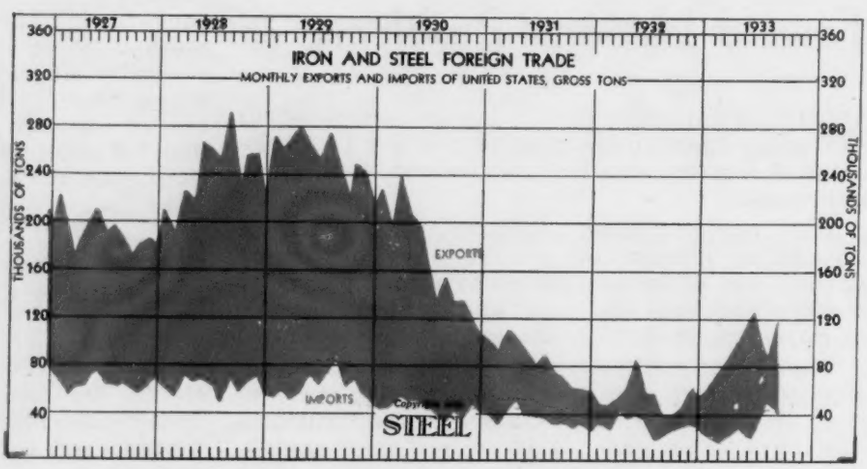
September, 1933	50,264
August, 1933	59,137
September, 1932	19,788

Pig Iron Production Declines 15 Per Cent In September

The average daily output of coke pig iron in September registered the first recession in six months. The daily rate in September was 50,264 gross tons, which compared with the 59,137-ton rate of August was a loss of 8873 tons, or 15 per cent. The September output declined to a point midway between the 42,165 tons of June and 58,108 tons of July, and ranks as the third highest for this year. The peak for this year being in August.

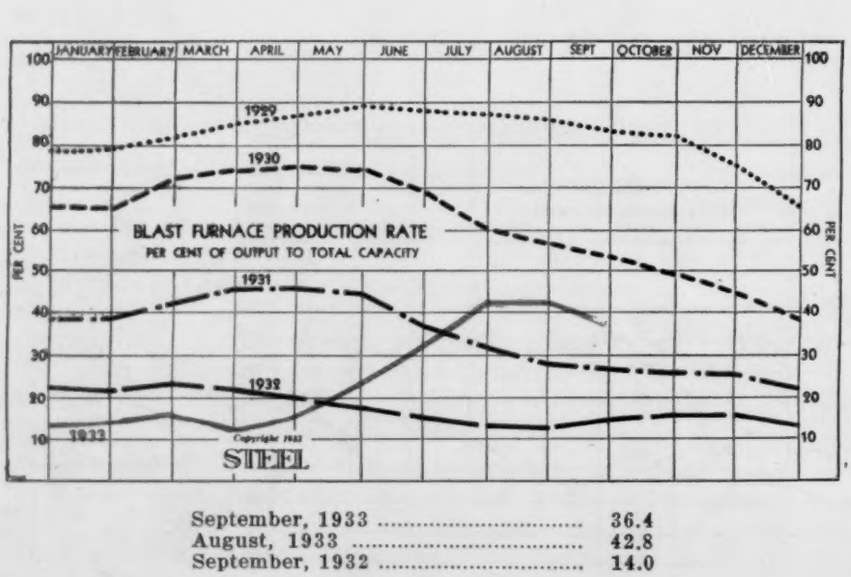
Steel Trade Balance Gains As Exports Rise Sharply

This country's export trade in iron and steel products during August gained 31,063 tons over the preceding month, to a total of 119,374 tons. This is the second highest figure for any month in 1933 and compares with 32,955 tons shipped to foreign ports in August, 1932. According to the bureau of foreign and domestic commerce, imports at 46,839 tons declined 5996 tons from July leaving a favorable trade balance of 72,535 tons for the eighth month.



Exports	
August, 1933	119,374
July, 1933	88,311
August, 1932	32,955

Imports	
August, 1933	46,839
July, 1933	52,805
August, 1932	23,623



September, 1933	36.4
August, 1933	42.8
September, 1932	14.0

Blast Furnace Rate Off As 9 Furnaces Are Dropped

With the total output of pig iron showing a decline of 325,334 tons in September, nine blast furnaces were dropped from the active list. This lowers the total of 98 furnaces active on August 31 to 89 on the last day of September. Relating production to capacity, operations in September were at the rate of 36.4 per cent, as compared with 42.8 per cent in August. In September, one year ago, the operating rate was down to 14.0 per cent.

STARTING with this issue, STEEL presents an important series of articles entitled "The Plastic Forming of Metals," based upon the results of extensive tests conducted at the Kaiser Wilhelm Institut fuer Eisenforschung, in Germany. The author is Professor Dr. Ing. Erich Siebel, whose investigations of and lectures on the subject of plastic forming are well known in Europe. The translation from German into English is by John H. Hitchcock, who some months ago completed his duties as research associate of the committee on heavy-duty, antifriction bearings at Carnegie Institute of Technology.

The rights to the publication of this work in English have been secured by STEEL from Verlag Stahleisen, m.b.h., Duesseldorf, Germany, publisher of *Stahl und Eisen*. The articles were issued by Verlag Stahleisen in book form in 1932 under the title "Die Formgebung im bildsamen Zustande." Since its publication, Professor Siebel has made some revisions, which will be incorporated in the text presented in STEEL.

This series will prove timely to American readers. Interest in technical forming processes has been increasing rapidly in the past decade. However, progress in the study of the subject probably has advanced more in continental Europe than in the United States. For this reason, the editors of STEEL feel that the articles will afford readers a clearer practical understanding of the forces and flow of material in compression, stretching, rolling, drawing, extrusion, piercing and deep drawing.

The following is a brief outline of the subjects covered in Professor Siebel's articles:

Introduction—Development of Forming Processes

Part I—Laws and Fundamentals of Plastic Forming
1. Plastic condition of material
2. Condition of constant volume and the displacement of material
3. Deformability of metals
4. The work of deformation
5. Classification and analysis of forming processes

Part II—Forces and Flow of Material in Technical Forming Processes
1. Compression and stretching
2. Separating force and rolling work
3. The phenomena of flow in rolling
4. Useful work and friction work in rolling
5. Forming by means of drawing
6. The requirement of force for extrusion
7. The force requirement for piercing
8. The force relations in deep drawing

Part III—Investigations of the Course of Deformation and the Stress Relations in Technical Forming Processes
1. Condition of deformation after termination of forming
2. Course of deformation and stresses in drawing, pressing and piercing
3. Stress relations in forging and rolling
4. Stress relations in piercing by skew-rolling process.

THE PLASTIC FORMING OF METALS

BY PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Preface

ALTHOUGH the plastic forming of metals has attained great significance, the scientific study of this subject has not passed beyond the experimental stage. Investigations in this field have increased during the last few years, however, and the fundamental relations are becoming better known. There is still a need for a comprehensive theoretical and experimental investigation of the technical forming processes—a sort of technological mechanics—which will permit a unified theory for all plastic behavior to be developed from the available facts. The work of P. Ludwik, which was directed toward this purpose, unfortunately is limited to few types of deformations. Similarly, the work of G. Sachs deals only with plastic forming by means of drawing, deep-drawing, and extrusion, while the more important and widely used process—rolling—is ignored.

Because of these circumstances, it appears desirable to compile and publish the results of extensive tests which were carried out by the author at the Kaiser Wilhelm Institut fuer Eisenforschung, beginning in 1925, and which served as the basis for the author's lectures on plastic forming at the Bergakademie Clausthal (Clausthal Mining institute) in the years 1928-31. In these tests it is shown that the use of the shear stress theory as the condition of plasticity, together with a consideration of energy requirements, permits a relatively simple numerical treatment of the most important forming processes. This treatment of the processes stands in agreement with, or can be adapted to, the experimental results. By means of the chosen method of treatment, it is possible to retain the conception, familiar to rolling mill engineers, of the volume displaced during forming as a measure of the work of deformation.

In order to permit a comprehensive and unified treatment of the various forming processes, it is first necessary to establish the general relations which apply to any plastic deformation. The second part of the discussion then includes tests of the forces and the flow of material in compression, stretching, rolling, drawing, extrusion, piercing and deep-drawing. In all forming processes, the simplest deforma-

tion ratios, which are indicated by the alterations of the outer dimensions of the formed material, were first considered as determining factors. The work of pure deformation determined in this way, and the effective forces determined by equating the internal and external work of deformation, were then compared with the requirements of force and energy determined by means of tests. In Part III an attempt was made to determine the actual course of deformation and the stress relations in the separate forming processes.

The treatise is admittedly not complete nor free from imperfections. The calculations extend only to the simplest relations, and in some cases require additional confirmation by means of detailed tests made in practice. However, the fundamentals of a mechanics of the plastic state are given here. It is hoped that in time a numerical treatment of the problem of plastic forming may be substituted for judgment, and that we shall learn by this means to govern the forces and the flow of material in all of the various processes involving the technical forming of materials.

Introduction

Development of Forming Processes

THE plastic forming of metals has gained much ground in the last decade, since it permits quantity production with the most favorable strength properties, at a low cost in comparison to that of forming by cutting. The increasing accuracy of forming, together with the diversity of forming possibilities, is continually leading the plastic forming processes into new fields of application.

In contrast to other branches of manufacture, the processes for the plastic forming of metals are the result of several thousand years of development.[1] The demand for weapons and ornament led to the early use of these processes. The art of forging and hammering can therefore be traced into ancient times. In the Middle Ages, the production of weapons was still the principal field of application. Although forging was the only method of producing wires which was known in ancient times, the art of drawing through dies was developed in the Middle Ages, and was first applied to the production of chain armor. In the meantime, the application of water power to forging and drawing had been made. No demand yet existed for larger forged bars. Such a demand first arose with the development of transoceanic shipping in the 16th and 17th centuries, in connection with which the production of ponderous anchors made great demands upon the forging practice of that time. In this period also, the rolling mill was originated, together with the forming process — rolling — which has achieved the greatest significance for working large masses of metal and for the production of raw material to be used in other forming processes. Additional processes for plastic forming were first developed at a much later time; for instance, the working of sheets by deep-drawing began in the middle of the preceding century, while the forming of nonferrous metals by extrusion, and the process for the production of seamless tubes, were first used in the latter half of the preceding century. The cold forming processes, such as drawing, cold rolling, stamping, coining, and deep-drawing, achieved their great significance in more recent times, because they have been found extremely suitable for quantity production under the restraint of the smallest tolerances.

[1] O. Johannsen: Geschichte des Eisens; Stahleisen, Duesseldorf, 1924.

Original Energy Was Impact

Various circumstances have exercised an influence upon the progress of development. The condition of the processes for the plastic forming of metals was dependent on one hand upon the demand for the resulting product, and also, on the other hand, upon the technical possibilities for producing and applying the deforming forces. In ancient times and in the Middle Ages, the metallurgical processes were able to provide only small quantities of metal to manufacturing industries. In this era, the great forces required to create the plastic condition could be produced only by impact, and the work was accordingly performed by means of a sudden absorption of the kinetic energy imparted to the forming tool. As forming processes, therefore, only the various types of forging, such as stretching, flattening and hammernig, came into consideration at first. This condition was not changed, even after men had learned to intensify the available impact effect by the application of water power. The coining of soft metals was also practiced. On the other hand, the forging of iron in dies was still unknown; first, because no quantity demand existed for this sort of forgings; further, because the existing arrangement for applying forces was not adequate; and finally, because the available tools could not withstand the high stresses which occur in this forming process. Comparatively small external forces are required in drawing processes. Therefore, applications of drawing are found early in the Middle Ages, in which for the first time a quantity demand existed for the resulting product—wire. Much greater than the external forces during drawing, however, are the reaction forces in the die, which act perpendicularly to the walls. Accordingly the question of tools has played the most important part in drawing since the inception of the process, and the production and maintenance of dies has strongly influenced the operation of drawing machinery even up to the present time.

During the last 200 years, as means have been found to control the forces and to provide the power required for deformation, the method of forging under the hammer has been replaced more and more extensively by rolling and by pressing. The development of the metallurgical processes on one hand, and the consumption on the other hand, have provided the prerequisites for mass production; so that all the forming processes which could not be adapted to mass production have gradually been relegated to the background. Moreover, a greater effort was made to reduce the subsequent work to a minimum by maintaining accuracy in the resulting products. To most of the forming processes which were then being developed, the characteristic is common that extraordinarily great demands are made upon the forming tools with respect to strength and resistance to wear, so that the question of tools frequently determines the practicability of the process. The greater the forces which are exerted, the greater is the wear of the forming tool. The limits of applicability of certain forming processes are determined in this way even today. For instance, the application of extrusion has greatest significance in the production of bars, tubes, and irregular sections of nonferrous metals; whereas, up to the present time, the material used for the tools is not at all suited to the resulting requirements for operation at high temperatures in the working of iron and ferrous alloys.

Early Theories Satisfied

Because of the early development of methods for the plastic forming of metals, investigation of the laws governing the plastic condition of material began at a time when the forming processes for the most part were already well established. For hundreds of years, investigators had been satisfied with the experience that metallic bodies begin to flow under the application of a sufficiently great pressure, whereby their dimensions diminish in the direction of force, and the dimensions in the transverse direction increase. It was also known

that, by means of heating, the plastic state could be reached more easily, with diminished requirements of force and with increased possibilities for deformation. The magnitudes of these force requirements, the character of the stress conditions under which deformation occurs, and the manner in which the individual movements of material take place; are matters upon which bases were still lacking, even at the time when the laws of elastic deformation were known in detail, by means of which the stress relations involved in machine parts and structural members could be calculated and predicted in advance.

In comparison with the elastic condition, the difficulties which oppose an exact understanding of the relations in the plastic region stand out clearly. Whereas the deformations in the elastic region are very small in comparison to the dimensions of the bodies considered, the deformations in the most important technical forming processes are very great, so that the basic shape of the body does not remain constant. In the plastic forming of metals, moreover, no definite relation exists between the stresses and the deformations, which are related in the elastic region by Hooke's law. Finally, the determining characteristics of the material are not constant for greater deformations, but are dependent upon temperature, time, and the magnitude of the momentary deformation.

Flow of Material Investigated

Scientific investigation of the forming processes began with the work of Tresca[2] and Obermayer[3], in the second half of the preceding century, on the discharge of plastic substances through orifices. Significantly, the flow of material was first investigated, which, by means of imbedded strata, appeared to be feasible in a comparatively simple way; whereas measurements of the deforming forces with the facilities then available presented much greater difficulties. Similar test methods have been applied in many cases, even in the most recent times.

The first theoretical work on plastic deformation was made by Saint Venant[4], who sought to apply the laws of viscous flow to the stress conditions of the plastic region. Some years later C. Fink[5] brought out a tentative solution concerning the determination of the work of deformation in rolling, which was based upon the observations that "ductile" bodies remain elastic up to a determined load, but flow under increased load, without loss of the cohesive properties of the material, and under practically constant stress. By means of combining this condition of plasticity with the laws for the external change of shape, as derived from the condition of constant volume, an expression for the work of deformation was derived which is still regarded as standard.

The first extensive tests in which the forces required for deformation were measured, were conducted in 1881 by the "Commission for Determination of the Force Requirements of Steam Engines for Rolling and Drawing Machines and the Power Consumption for Rolling Iron and Steel[6]", appointed by the machinery section of the Vereins deutscher Eisenhuettenleute (German Iron and Steel institute). The test report by E. Blass shows that even then the external equilibrium of forces in the rolling process, and the relation between the resistance to deformation of the rolled material and the rolling force and power consumption, were clearly known. Improvement in the technique of measuring, the introduction of electric drives for roll stands, and the substitution of pressing for forming by impact, have led in later times to an abundance of tests, in which the forming processes have been studied by means of force measurements. These tests were primarily of practical significance, and did not promote the essential theoretical knowledge.

On the other hand, the introduction at the beginning of the century of an exact condition of plasticity brought with it a new point of view, by which a powerful impetus has been given to theoretical knowledge. However, the first application of this knowledge to the technical forming processes came in the last few years. At first, investigators were satisfied with the investigation of small deformations and simple cases of loading, such as bending and twisting; the determination of the stress distribution in thick-walled vessels, disks, etc., which were stressed up to the inception of flow. In this connection, the theory of the internal stresses[7], which remain in structural parts as a result of stressing them beyond the elastic limit, also is pertinent. At this point, in addition, the work of H. Hencky[8] and L. Prandtl[9], on the equilibrium of plastic bodies and on the formation of slip planes, is mentioned. All these works are limited in common to small deformations which do not alter the basic shape of the bodies, although the transformation of this shape constitutes the sole purpose of the technical forming processes.

(To be Continued)

[2] H. Tresca: Memoires sur l'ecoulement des corps solides; Ann. du conservatoire des arts et metiers, 1865; Comptes rendus, 1867.

[3] A. v. Obermayer: Versuche uber den Ausfluss plastischen Tones; Ber. d. Kaiserl. Akad. d. Wissensch., Wein, 1868, p. 737.

[4] Saint Venant: Differentialgleichungen der Plastikodynamic; Comptes rendus, 1870.

[5] C. Fink: Theorie der Walzarbeit; Z. Bergwes. Preuss., 1874, p. 200.

[6] St. u. E. 1 (1881) p. 57.

[7] A. Nadai: Der bildsame Zustand der Werkstoffe; J. Springer, Berlin, 1927.

[8] H. Henky: Uber einige Falle des Geichgewichts an plastischen Korpern; Z. angew. Math. u. Mech. 3 (1923) p. 241.

[9] Prandtl: Anwendungsbeispiele zu einem Henkyschen Satz uber das plastische Gleichgewicht; Z. angew. Math. u. Mech., 3 (1923) p. 401.

Sheet Steel Caps Close Pipe Line

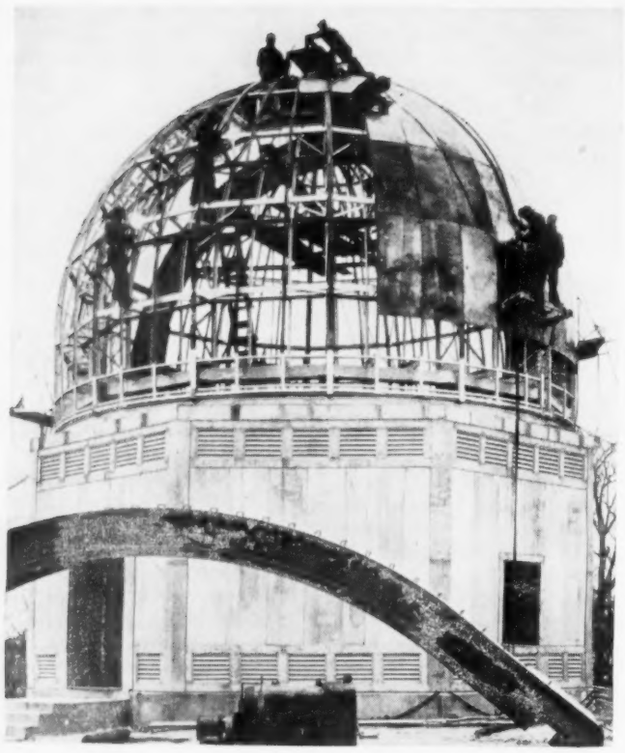
A NEW and rather novel use for sheet steel has been found in welded pipe line construction. The accompanying illustration shows a 200-foot length of 6-inch pipe with the end closed by a pressed steel cap, the flange on which is belled slightly for easy putting on and taking off.

Good practice in pipe line construction requires that the ends of the 200-foot sections, made up of

five 40-foot lengths joined by rotation welding, be closed by some means until these sections are joined to form a continuous line. This prevents small animals, workmen's clothes and lunch boxes, tools, dirt and stones, and the like, from being left in the completed line.

Caps such as the one illustrated take the place of makeshift methods used formerly such as sacks or tar paper tied over the ends. These caps are made from ⅛-inch sheet and can be used many times. About 100 caps would be required for each pipe line construction gang and conceivably might last for a 50-mile line, if not longer. Considering the thousands of miles of pipe line laid in a normal year, this represents a fair outlet for sheet steel.

So far as is known, the first job on which such caps were used was the Toledo to Detroit 6-inch oxy-acetylene welded line completed recently.



Welding outer sheets on the dome of the larger of the two telescope observatories erected recently in Washington for use of the navy department

Telescopes Are Housed in Welded Steel Buildings

FOR housing two giant telescopes at the United States Naval observatory, Washington, the McHarg Co. Inc., New York contractor, has completed two structures unique in the use of arc welding in structural framing and the attaching outer and inner sheet steel coverings.

Larger of the two structures accommodates a 40-inch diameter reflecting type telescope and comprises a revolving dome supported above a two-story building. The lower portion of the dome is cylindrical with an outside diameter of 35 feet and the upper section is hemispherical. The supporting building is a steel-framed octagonal structure, 15 feet high, built on reinforced concrete piers, with an outside sheathing of corrugated sheet steel and an inner lining of sheet steel, there being a 30-inch air space between the two. The operating floor, constructed of ¼-inch checker plate, is at the top of this building. A circular T-rail setting on this floor and near its outer edge forms the track for the revolving dome. A slot or opening for the telescope, 7 feet 6 inches wide, extends from the bottom of the dome to a point 4 feet beyond the vertical center. The dome is framed of structural steel members, with an outer and inner sheathing of 20-gage one-pass cold-rolled sheet steel enclosing a 30-inch air space.

The slot opening is closed, when the telescope is not in use, by a pair of shutters located on the outside of the dome. Each shutter is supported on two pairs of double flanged wheels, each pair running on a T-rail, one at the upper and one at the lower end of the shutter, attached to the dome. The shutters separate to open and the movement is accomplished by traveling nuts, one right hand and one left, on a hand-operated threaded shaft engaging with the lower end of the shutter. The movement of the upper end of the shutter is synchronized with the lower end by an equalizing device in the form of a wire rope running over sheaves on the dome and attached to both ends of the shutter.

The dome is revolved on 14 double flanged wheels equally spaced around the base. The wheels are pressed onto the axles and the axle journals turn in self aligning roller bearing pillow blocks. The pillow blocks are attached to the under side of the circular steel girder, constructed of two 8-inch channels, which forms the base of the dome. Two of the wheels on which the dome rests, are connected together and the pair driven by a two-speed gearmotor mounted on the dome, effecting one revolution of the dome in 4 minutes and 12 minutes, respectively.

Auxiliary Frame Used

A telescoping frame, known as a "tube extension," comprising three aluminum frames or sleeves with louvred sides, is mounted on four wheels and travels on rails attached to the inner sides of the slot frame. When in use this frame is centered over the telescope. The tube extension is propelled the length of the slot by a two-speed reversible gearmotor through two endless chains.

The motion of the dome and the tube extension is controlled by manually operated pushbutton stations through magnetic contractors but provision has also been made for automatic control from the motion of the telescope.

Four motor-driven fans set in openings in the inner sheathing just above the base of the dome circulate air from the interior of the dome, through the air space and then out through vents at the top of the dome. Louvres located in a band in the outside sheathing near the base of the dome also permit air to be drawn in.

Seven vents in the interior sheathing of the supporting building and two sets of louvres located in bands at the top and bottom of the exterior sheathing permit the circulation of air through air space surrounding this part of the structure.

The purpose of circulating air between the walls is to maintain the temperature of the outside air and prevent heat waves from the steel structure interfering with the beam of light entering the telescope.

The entire structural steel frame was field welded. Outside sheathing was attached to the frame of the dome by continuous welded seams. A spacing of 3/16 inch was provided between adjacent sheets for this purpose. The interior sheathing was spot welded.

There are no horizontal members of the dome frame which are flush with the inner and outer flanges of the arch

frames. Light angles therefore were placed at the horizontal seams and mid-point of each sheet to stiffen the sheets. All welding was done with a short arc with the current limited to 150 amperes on the structural steel and 50 amperes on the sheet metal.

The smaller of the two structures houses a 15-inch diameter refracting-type telescope and while somewhat similar in design to the larger unit, has no inner sheathing, air space or tube extension. The outside diameter is 25 feet and the supporting building is 9 feet high.

The rotation of the smaller dome is effected by an endless cable running around a circular angle at the bottom of the inside of the dome and a bight in the rope around a sheave driven by a reversible motor through a worm gear reducer. The speed of the dome is one revolution in 3 minutes.

All welding work on the structures was done by the J. K. Welding Co., New York, using equipment built by the Lincoln Electric Co., Cleveland.

All the structural steel fabrication was done by the Virginia Bridge & Iron Works, Roanoke, Va. An illustration of the completed larger observatory was published in the June 5 issue of STEEL, p. 11.

Controls Quality In Carbon Steels

CONTROL of quality factors in the manufacture of open-hearth steel and its importance to users has been made the subject of a comprehensive study by the Carnegie Steel Co.. Pittsburgh. In this study, conclusion have been reached to prove that the scope of usefulness of carbon steel can be broadened materially and its mechanical and heat treating properties, including tensile properties, machinability and toughness, can be much improved by close and positive control of all quality factors during the process of manufacture.

The history of the investigation and the conclusions arrived at are presented in a 62-page booklet just prepared by the company. The text is divided into five parts, the first dealing with the methods for selecting steel, the relative importance of chemical and physical specifications to other factors controlling quality steel, obscure differences in steel not explained by chemical or physical tests, failure of physical tests employed in testing steel, austenitic grain size as a quality factor, and the importance of uniformity to the users of steel.

In the second section are given the chemical analysis, some of the structural characteristics, and the physical properties after heat treatment of 11 heats selected at random from those made under the company's system of controlled practice. Four different grades and three types of steel are included. Accompanying this section are 16 pages which show 11 photomierographs of typical grain size characteristics of each steel, 122 macrostructures of the steels quenched from temperatures ranging from 1300 to 2400 degrees Fahr., including forging and heat treating ranges, and 37 graphs which give the physical properties of the steels in normalized and heat treated condition.

Processing Is Discussed

Important characteristics commonly experienced in the processing, heat treatment and inspection of the condition and physical properties of various commodities and parts made from controlled steels are described and illustrated in the third section. Subjects dealt with include cold shearing, flash trimming, heating cycle in heat treatment, depth of hardness, machinability, worm holes, case hardening, bend and distortion tests after forging and heat treatment, and torsion tests after heat treatment.

An idea of the various methods of control employed in making a heat of forging steel is presented in Part IV, the system being depicted by 26 illustrations of steelmaking and physical testing equipment. A classified bibliography completes the booklet. In this fifth section are 52 quotations from and brief abstracts of papers reciting the work of numerous investigators on the subject of quality steels. Reference is made to service and laboratory tests, defects and grain flow in drop forgings, sensitivity of steel, inclusions, soundness, chemical composition, normality and abnormality, austenitic grain size, and effects of grain size on physical and heat treating properties.

Metallurgists and consumers of steel interested in receiving a copy of this treatise may address their requests to the Carnegie Steel Co., Carnegie building, Pittsburgh.

A.S.M.E. To Hold Annual Meeting

THE American Society of Mechanical Engineers will conduct its fifty-fourth annual meeting in New York, Dec. 5-7. Headquarters and meetings will be in the Engineering Societies building. Simultaneous technical sessions are scheduled both morning and afternoon during the three days.

In conjunction with the meeting, Stevens Institute of Technology, Hoboken, N. J., has arranged a Frederick W. Taylor memorial celebration for Dec. 7, the program to be given at the institute. Features of the program include a series of exhibits, a lathe demonstration and play in the afternoon and dinner in the evening. Mr. Taylor was co-inventor in 1900 of high-speed steel which revolutionized the cutting of metals.

Among papers announced for presentation at various A. S. M. E. sessions are the following:

Fuels

"Burning Characteristics of Pulverized Fuels and Radiation from Their Flames," by R. A. Sherman, fuel engineer, Battelle Memorial institute, Columbus, O., and chairman, A. S. M. E. fuels division.

Machine Design and Materials Handling

"Why Has the Machine Designer Failed To Consider Motion Study?" by Allen H. Mogenson, junior consulting editor, *Factory Management and Maintenance*, New York.

"Appearance in Design," by Joseph Sinel, industrial designer, New York.

"Maintenance of Materials Handling Equipment," by J. M. Enders, General Electric Co., Schenectady, N. Y.

Heat Transfer

"Fuel-Fired Heat Treating Furnace Transfer Rates," by M. H. Mawhinney, Electric Furnace Co., Salem, O.

"Transfer of Heat in Electric Furnaces," by R. D. Nan Nostrand, industrial heating engineering department, General Electric Co., Schenectady, N. Y.

Milling and Planing

"Economics of Planing Versus Milling," by A. C. Danekind, General Electric Co., Schenectady, N. Y.

"Economics of Planing and Milling as Machine Shop Processes," by R. E. W. Harrison, Ingersoll Milling Machine Co., Rockford, Ill.

"Comparative Advance of Planers and Milling Machines," by Forrest Cardullo, chief engineer, G. A. Gray Co., Cincinnati.

Applied Mechanics

"Stress Concentration at Fillets," by A. M. Wahl, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Foundry

"Meaning of the Transverse Test of Cast Iron to the Designing Engineer," by James T. MacKenzie, metallurgist, American Cast Iron Pipe Co., Birmingham, Ala.

"Welded Joints," by Everett Chapman, vice president, Lukenweld Inc., Coatesville, Pa.

Creep of Metals

"Correlation of Creep Data," by P. G. McVetty, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Report of joint high temperature committee of A. S. M. E. and A. S. T. M. on 18-8, containing fatigue tests at elevated temperatures.

Stress Analysis

"Some New Experiments on Thin Sheet Construction," by F. J. Bridget, A. B. Vosseller and C. C. Jerome, California Institute of Technology, Pasadena, Calif.

"Large Deflection of Thin Plate," by Stewart Way, University of Michigan, Ann Arbor, Mich.

Metal Cutting

"Performance of Cutting Fluids When Cutting Off Various Metals in a Power Hacksaw," by O. W. Boston and C. E.

(*Please turn to Page* 37)

Finds No Serious Effects in Welding Galvanized Steel

WELDING practice in ship, ordnance and aircraft work was discussed by the American Welding society, holding its fall meeting in Detroit, Oct. 2-5. G. H. Moore Jr., Newport News Shipbuilding & Dry Dock Co., Newport News, Va., outlined the experience of his company on welding in the construction and repair of ships. Leon C. Bibber, bureau of construction and repair, United States navy, Washington, described tests on the welding of galvanized steel. He named three problems—effect of welding upon the galvanized parts, effect of galvanizing upon the weld and effect of zinc fumes upon the welders.

Mr. Bibber exhibited photomicrographs showing that while welding burns off the outer coating of pure zinc, a coating of zinc-iron compound remains. Tests show that this remaining coating is highly resistant to corrosion. The effect of galvanizing on the weld was shown to be a slight loss in strength—not considered serious. The problem of zinc fumes still needs attention. The speaker said that masks, ventilating fans, and working welders for brief periods in relays all had been tried, and although they prove helpful, they did not solve the problem satisfactorily.

W. L. Warner, Watertown arsenal, Watertown, Mass., described the results of extensive tests on the welding of structural nickel steel. He devoted considerable attention to the hardening effect of welding. He prefers preheating to postheating as a means of keeping hardness down. He declared that industry still is looking for a good alloy welding rod which will enable welders to obtain full strength welds in heavy nickel steel plates.

Methods for Quality Control

T. H. Speller, Curtiss Aeroplane & Motor Co. Inc., Buffalo, related the experience of his company in controlling welding quality. Each welder is required to weld periodically seven samples involving 12 forms of welds. Nonwelding inspectors occasionally test to destruction certain work of all welders. All of these data, together with the welding foreman's opinion of the work of each welder, are filed. Each welder has an identifying mark which goes on every weld he makes.

This system enables the company to keep a close check upon the performance of its welders and to allot work to those best qualified to do it. For instance, if an exacting welding job comes up, the records are examined, and if possible, the job is given to the men whose records show that they are unusually adept at making welds of this particular kind.

Pressure regulators and regulation problems in the oxyacetylene welding and cutting industry were considered by George M. Deming, Air Reduction Sales Co. Inc., New York. Phases discussed included details of operation as well as types employed. One point stressed concerned the regulation end-point. There is a rather definite limit to which the diameter of the nozzle orifice may be reduced, for the nozzle must be large enough to handle the maximum volume of gas it will be called upon to discharge, and to do so without giving rise to an excessive pressure drop.

The disadvantage of employing an excessively small nozzle, Mr. Deming explained, is most apparent when the regulator inlet pressure is low. When the inlet pressure is high, as when a full cylinder is in use, the density of the gas discharging from the nozzle is great and hence the discharge capacity of the nozzle is considerably greater than it is at low cylinder pressures. This simply means that the regulator can handle a much greater load at higher cylinder pressures than it can when the cylinder pressure is rather low.

Discusses Regulation End-Point

For any given outflow there is a cylinder pressure below which the regulator will not function as a pressure regulating device. This is conveniently referred to as the "regulation end-point" for the particular rate of flow involved. In many regulators, particularly in the better types of double-reduction units as well as for most cutting regulators, the regulation end-point is determined to some extent by the operating pressure which is being used. Hence, when the regulation end-point is given, unless otherwise stated, it should be assumed that the value is for the maximum delivery pressure for which the regulator is designed.

The regulation end-point of a regulator is one of the most important measures of performance because it indicates whether the regulator is economical to operate. A regulator with a high regulation end-point is one which will leave much unused gas in the cylinder when it finally becomes necessary to remove the regulator from the cylinder, he asserted.

It is helpful to know that most regulators give slightly better results if the delivery pressure is reached by a clockwise turning of the adjusting screw instead of dropping back from a somewhat higher pressure following a careless preliminary adjustment. Oxygen regulators should be reliably protected against seat ignition.

Thermit welding of rail joints without interrupting traffic was described by J. H. Deppeler, Metal & Thermit Corp., New York. One of the outstanding advantages in employing this procedure is the elimination of rail joints which of course, obviates noise and vibration as cars proceed over the track. Tests have revealed that expansion joints are unnecessary in long stretches of welded track.

Better Welds at Lower Cost

Development of the shielded carbon arc process has resulted in high-quality welds and low cost of welding, according to E. W. P. Smith, consulting engineer, Lincoln Electric Co., Cleveland. He stated the electric arc is normally rather difficult to control. It sets up its own magnetic field; and the passage of the welding current through the parts being welded sets up other fields. The result, he explained, is that the arc is sprayed out and has a tendency to wander.

It is evident, he continued, that the weld metal under certain conditions would be subject to the action of the atmosphere and therefore, would be irregular in quality. To eliminate this possibility, he explained, a controlled atmosphere is formed around the arc and weld metal by passing against the hot carbon what is known as a fibrous autogenizer. This is a chemically treated fibrous cord which burns as it comes in contact with the hot carbon. It liberates gases which shield the arc and provide an oxygen and nitrogen excluding atmosphere in which the weld metal and arc operate.

Shielded carbon arc gives weld metal with ultimate strengths from 65,000 to 76,000 pounds per square inch and elongations ranging from 20 to 30 per cent in 2 inches of weld metal. Tests made on average structural steel, with ultimates in the range of 55,000 pounds per square inch, show the elongation to be 22 to 27 per cent in 2 inches with elastic limit of 30,000 pounds per square inch. This is for plate, the speaker stated. The corresponding figures for weld metal for a particular test are 75,000 pounds per square inch in ultimate, 25 to 30 per cent elongation in 2 inches and elastic limit of 55,000 pounds per square inch.

Discussion brought out the statement that carbon does not affect the weld to any marked extent. The author emphasized, however, that the base metal and heat treatment influence the kind of joint obtained to a large extent.

In discussing "Impact Values of Weld Metal," J. C. Hodge, metallurgist, Babcock & Wilcox Co., Barberton, O., presented data to show that

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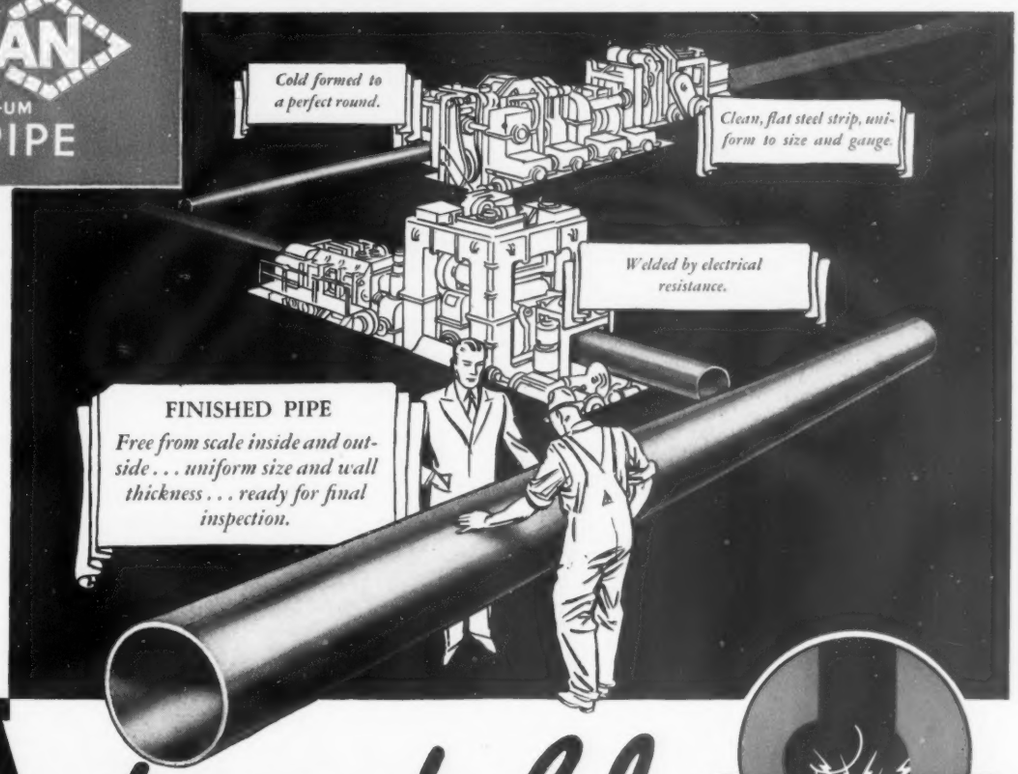
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impact values of welds made with bare electrodes vary considerably, those applying to welds made with covered electrodes are satisfactory, those covering carbon arc welds are fair, whereas gas-protected welds have exceptionally high impact value. Sorbitic structures do not affect the inpact values of welds to any marked extent, he stated, nor is there any great change in impact resistance between weld metal stress relieved at 1200 degrees Fahr. and annealed material.

R. R. Kondal, Wickes Boiler Co., Saginaw, Mich., in citing requirements for the prefabrication of large welded machines and other articles, mentioned that before a job is accepted a complete test should be carried out to determine definitely what could be expected in the completed job. This, he stated, requires chemical and metallurgical laboratories equipped to make tests and analyses on any type of metal. A complete drafting room should be available that would be able to design the product in a preliminary way before the job is accepted and to make the detail drawing before the job is transferred to the shop.

The layout man, he pointed out, must have stock with which to work. He suggested that the stock should include steel of the following characteristics: Tensile strength, 55,000 to 60,000 pounds per square inch; yield point, 50 per cent of the tensile strength; elongation in 8 inches, found by dividing 1,500,000 by the tensile strength with a minimum of 20 per cent; carbon content, 0.30 per cent; manganese, 0.30 to 0.60 per cent; phosphorus, under 0.40 per cent; and sulphur, under 0.50 per cent.

Unless the product is annealed or stress relieved, it will have different strengths, hard spots and will warp to some extent after it is machined. If it is to be used in a place where the corrosion is fast, the speaker emphasized, a strained structure will corrode much faster than one whose stresses have been taken out by heating. The annealing furnace should be capable of heating the object to at least 1200 degrees Fahr. slowly and uniformly, and closed to cool slowly. In conclusion the speaker mentioned that the X-ray is valuable in checking welds for cracks or defects during fabrication.

Other papers presented at the session include "Welding as an Aid to Modernization of Breweries" by D. S. Lloyd, Dominion Oxygen Co. of Canada, Toronto, Ont., and "Limitations of X-Ray Inspection" by A. S. Douglass, construction engineer, Detroit Edison Co., Detroit.

Foresee New Chromium Steel Of Broader Utilization

CONSIDERING the results of experimental and commercial work performed, it seems reasonable to conclude that titanium or columbium will permit the introduction of a new chromium steel and so facilitate the production of the plain high chromium steels as to broaden their field of utilization.

This was the substance of a discussion on titanium and columbium in plain high-chromium steels presented by Russell Franks, Union Carbide & Carbon Research Laboratories Inc., New York, at the meeting of the iron and steel division of the American Institute of Mining and Metallurgical Engineers in Detroit Oct. 5. Mr. Franks had collaborated with Dr. F. M. Becket, president of the organization, in compiling the data. Results of the work disclosed that the titanium and columbium elements in proper proportion act as effective softeners.

Tests were conducted under atmospheric conditions embracing titanium-treated and untreated low carbon 5, 6, 7.5 and 9 per cent chromium steels. These samples and others of the higher chromium groups were exposed for a long period of time. Briefly, the most important feature uncovered by these tests, according to Mr. Franks, is that through the agency of titanium there appear interesting commercial possibilities for a steel containing 7 to 9 per cent chromium—a steel not completely resistant to staining but nonetheless one which affords a large measure of protection against progressive rusting. Even without annealing, the properties of steel of this class are such as to indicate numerous commercial applications.

Plain carbon 18 per cent chromium steels continue to give excellent service in many applications. Mr. Franks explained, however, that a desired improvement is increased softness and amenability to deep drawing operations, particularly by the fabricator, and the addition of titanium to this steel assists considerably in this direction.

Although titanium dominated the discussion, the speaker emphasized that all the beneficial effects obtained by this element have been obtained through the addition of columbium, a metal which in the form of a ferroalloy can be incorporated with high recovery under good melting practice appropriate to the high chromium steels.

Results of an X-ray study of the diffusion of chromium into iron revealed noteworthy accomplishment. The discussion was a condensation of a thesis submitted by Laurence C. Hicks as part of his requirement for the degree of doctor of science from Massachusetts Institute of Technology last June.

Penetration Shown Distinctly

In the data on the sintered material broken from the surface of the specimen, it was noted that there had been considerable penetration of iron into the chromium powder. For the most part the lines on the spectrograms were distinct and sharp, permitting accurate measurement. When the work was started, explained Mr. Hicks, it was hoped that the coincidence between the limit of the gamma loop at the diffusion temperature and the chromium content at the boundry line could be proved by the presence of lines from the gamma structure on the X-ray spectrograms of specimens quenched from the diffusion temperature. The diffusion curve obtained, however, showed that this would be impossible because the drop in concentration is so abrupt that the quantity of material that would be retained in gamma form would be insufficient to give a diffraction pattern.

According to Mr. Hicks, previous investigators have assigned the change of slope in the diffusion curve to the fact that it will be more difficult for atoms to migrate across the region of disorganization between the two phases existing at the temperature of diffusion. From the results obtained, he declared that it would seem that this explanation is not entirely satisfactory. The slope of the diffusion curve as presented in connection with the paper offers an explanation of the polishing and etching effects in that there must necessarily be an abrupt change in hardness and resistance to chemical attack, corresponding to the abrupt change in concentration in the specimen, Mr. Hicks concluded.

A comprehensive discussion of improvements in the vacuum fusion method of determining the gas content of metals occupied a subsequent place on the program. This was conducted by Lewis Reeve, A. O. Smith Corp., Milwaukee, who explained that considerable work had been done in this direction as part of a laboratory program of investigation of the properties of electric arc welds.

Slides were used to illustrate his explanation of apparatus and the method of carrying out a vacuum

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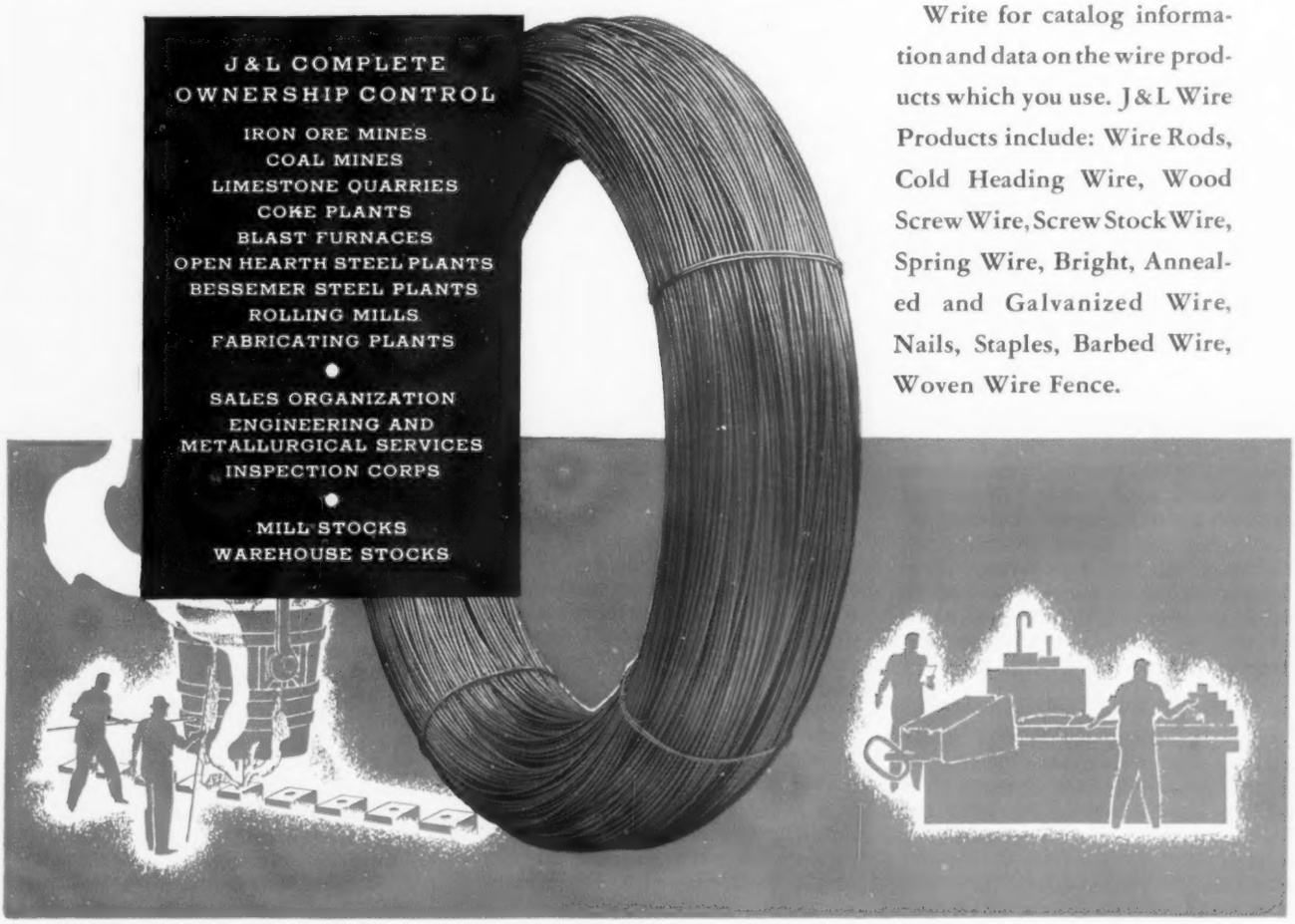

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fusion analysis was described in detail. It is interesting to note that the steel sample in the preliminary stages of determination, when the graphite crucible was being evacuated, was supported against the cool wall of a brass head by means of an electromagnet. By de-energizing this magnet the specimen could be dropped into the hot crucible below. Subsequently another method of support was devised for nonmagnetic samples, in which the specimen was maintained in place on a tiny shelf that could be swung out of place by a steel rod actuated by a magnet.

Mr. Reeve brought out in his discussion that the normal experimental error of the vacuum fusion method for uniform steel samples may be taken as being about 0.002 per cent for O_2 and N_2 and about 0.0002 per cent for H_2, corresponding to approximately 0.25 cubic centimeter of each of these gases on a 10-gram steel sample. In connection with most steel samples errors due to manganese are eliminated by using a fresh graphite crucible for each determination and by maintaining as high a vacuum as possible during the collection of the gases from the melt. Errors due to aluminum are likely to enter if the alumina oxygen exceeds 0.01 per cent or metallic aluminum exceeds 0.3 per cent. A minor source of error arises if Na_2O is present. This volatilizes and is not estimated; the amount usually is small, he asserted.

Details Steps in Producing Open-hearth Rimming Steel

STEELMAKING practice was made the subject of the concluding session of the American Society for Steel Treating which held its annual convention in Detroit, Oct. 2-6. Dr. C. H. Herty, Carnegie Institute of Technology, Pittsburgh, presiding at this session, pointed out that the question of a definition for rimming steel arises constantly. Consequently, the publication committee of the society had arranged for presentation of a paper describing the manufacture of this grade of steel so written that the layman might understand the process.

The paper undertaking to meet this assignment was prepared by W. R. Fleming, metallurgist, Andrews Steel Co., Newport, Ky. In absence of the author, Dr. Herty abstracted the paper, then discussed it briefly by illustrating four types of mold action, pointing out just where blowholes in the ingot might be expected. He also reviewed the various steps involved in making a heat of rimming steel in the open hearth.

Considers Ingot Solidification

The type, shape and size of mold; temperature of the steel above its melting point; analysis of the metal; and the temperature of the mold are factors which influence solidification of steel, according to L. H. Nelson, open-hearth metallurgist, Republic Steel Corp., Buffalo, N. Y. In discussing solidification of steel in ingot molds, he emphasized that large ingots usually should be poured in molds having a relatively heavy mold wall in order to assist in speeding up solidification and thus effect a decrease in segregation and porosity.

Heaviness of mold walls, the speaker contended, exerts some influence on strains produced in the ingot when cooling in the mold during solidification. This is especially true in the case of air-hardening steel poured in small molds, he stated. In this respect, the author pointed out, the effect of heaviness of mold wall on cooling strains is a much more important factor in selecting the proper mold than the effect of mold wall on the rate of solidification. In conclusion the speaker suggested that the ingot length should range from 2 to 2.8 times the ingot width and the taper at least 0.5-inch per foot of length in order to secure the production of sound ingots.

Praise Deoxidation Study

A paper on the application of thermodynamics to the deoxidation of liquid steel, by John Chipman, research engineer, University of Michigan, Ann Arbor, Mich., was acclaimed one of the most important contributions dealing with steelmaking practice of the past decade, following its presentation. The author presented experimental evidence to show that the oxygen present in liquid steel is in the form of FeO and various computations to establish deoxidizing powers of nine elements.

A paper dealing with some factors affecting the physical properties and corrosion resistance of 18-8 chromium-nickel steel wire also was presented at the final session by W. H. Wills, co-author with J. K. Findley, metallurgist, Ludlum Steel Co., Dunkirk, N. Y. Advantages and disadvantages of the alloy in the higher carbon range—0.15 to 0.20 per cent carbon—were pointed out, also effects of variation of chromium and nickel content.

Methods for stabilizing the alloy that could be applied particularly to higher carbon material were discussed by the authors. These consist of heat treatment at 1500 degrees Fahr. for various lengths of time to develop a structural condition resistant to decompositon and the addition of a titanium content. The experiments showed that the latter is more practical as a stabilizer, especially for material going into wire.

Cobalt and Age Hardening

Addition of cobalt to age-hardening alloys serves in a general way to further increase the age-hardness and frequently to increase the temperature of the maximum age-hardness. This fact was set forth by R. H. Harrington, research metallurgist, General Electric Co., Schenectady, N. Y., in discussing the present status of age-hardening.

Cobalt, stated Mr. Harrington, usually acts in a two-fold manner. Serving as a desolvent, it reduces the solubility of the precipitating constituent and, to a certain extent, goes into solid solution in the solvent lattice. In the second place, the speaker pointed out, most of the cobalt if added correctly, enters into a ternary constituent with the precipitating agent, thus usually decreasing the solubility of the constituent. In conclusion, the speaker mentioned that plans were being entertained to study certain other properties of alloys in the light of age-hardening.

Absence of aging after quenching or at least the evidence of but little aging, is no indication that quenching has not produced an ageable condition, contended Dr. A. Sauveur, Harvard university, Cambridge, Mass., in contributing a paper on aging of metals and alloys. Rather it points to the precipitation having occurred during quenching, leaving little solute in solution for subsequent precipitation. This fact, Dr. Sauveur emphasized, is of much importance in the study of aging.

Iron Carbide Held Responsible

Three conditions may exist, he stated: The metal in the quenching bath may age completely, partially, or not at all. Little doubt exists but that the carbide Fe_3C is the precipitate solute responsible for the hardening of steel through rapid aging in the quenching bath, he contended. He expressed the belief that in commercial steel, carbon is chiefly responsible for the aging of ferrite, that nitrogen when present in unusually large proportion greatly intensifies aging and that the part played by oxygen is in doubt. In conclusion, the author pointed out that the amount of aging seems to increase with the amount of free ferrite present in the alloy, which in turn depends upon the percentage of carbon and the heat treatment.

In citing the results of a study of

(*Please turn to Page* 37)

One section of Convention Hall, Detroit, shortly before visitors were admitted to the metal exposition which was in progress there recently

A Further Glimpse of Exhibits at the NATIONAL METAL EXPOSITION

GAS and electric heating and heat treating furnaces, gas burners and heating elements comprised one of the major divisions of the annual National Metal exposition in Detroit, Oct. 2-6. A considerable portion of the floor space in Convention Hall was devoted to this class of equipment. Visitors spent much time inspecting these exhibits for the various units almost without exception were in operation to simulate service conditions.

Notable among the exhibits of gas-fired equipment was that of the Surface Combustion Corp., Toledo, O. This company demonstrated a controlled gas carburizing furnace, an atmosphere furnace, an air heater, a forge heating furnace utilizing the principle of diffusion combustion, and a wide range of burner equipment, and showed specimens of carburized work and photographs of furnace installations.

Applications Are Numerous

A new continuous heating machine for continuous heat treating in gaseous atmosphere was operated by the American Gas Furnace Co., Elizabeth, N. J., in addition to a bell-type retort furnace for gas carburizing, nitriding, combination treatment, as well as bright annealing, hardening and tempering. Burners, automatic temperature control and data on typical furnace installations also were to be seen.

Bellevue Industrial Furnace Co., Detroit, featured a gas-fired high-speed hardening furnace, gas burners and a line of refractory materials. A gas-fired convector for generating and transmitting high heat through furnaces and ovens was demonstrated by Paul Maehler Co., Chicago.

A device for changing a distillate fuel from liquid to gaseous state and mixing it with air for combustion was shown in conjunction with two high-speed furnaces equipped with automatic temperature control. An electric-driven turbocompressor in the booth of Spencer Turbine Co., Hartford, Conn., supplied air for the gas furnaces in the exposition. This company also showed a new 1-2 horsepower single-stage turbocompressor, a still smaller unit, and a 5-horsepower unit with stainless steel casing for handling corrosive gases.

ON the accompanying pages STEEL *concludes its description of products and equipment displayed at the National Metal exposition in Detroit, Oct. 2-6. Reviewed this week are furnaces, refractories, abrasives, welding and cutting machines and accessories, instruments, testing machines, alloys and castings. Described in the Oct. 9 issue of* STEEL *were steels, machine tools, heat treating materials, cleaning compounds, lubricants, chemicals and miscellaneous products.*

The exhibit of the Electric Furnace Co., Salem, O., consisted of a wide assortment of photographs and engineering data with electric and fuel-fired furnaces for heating and heat treating operations. Emphasis was placed on the company's equipment for continuous heat treating, bright annealing, nitriding, and brazing in a special atmosphere.

C. I. Hayes Inc., Providence, R. I., demonstrated a small high-speed electric furnace equipped with a gas curtain to prevent oxidation and scaling. Hardening of small steel parts was demonstrated. Cooley Electric Furnace Co., Long Island City, N. Y., exhibited electric laboratory furnaces utilizing a new type of heating unit which is impervious to the action of chemical fumes. A new refractory of high thermal conductivity also was shown.

Ajax Electrothermic Corp., Trenton, N. J., exhibited an electric furnace for bright annealing and brazing ferrous and nonferrous metals; operated in conjunction with it was an ammonia dissociating equipment. Also shown in sectional model was a newly-developed helical element for temperatures up to 2000 degrees Fahr. in an oxidizing atmosphere.

Rivet Heater Exhibited

Nonmetallic electric heating elements for use in supplying heat to all types of heating and heat treating furnaces were exhibited by the Globar Corp., Niagara Falls, N. Y. A two-electrode electric rivet heater; a two-electrode full automatic forging heating equipped with photoelectric eye to prevent under and overheating; and a semiautomatic horizontal end heater for valve stems and similar products, comprised the equipment demonstrated by the American Car & Foundry Co., New York. This equipment provides heat from the resistance of the steel between the electrodes.

Sponsored by electrical industries

and attracting the attention of show visitors was a two-room enclosure featuring a wide assortment of products which had been processed by electric heat.

Abrasives and refractories constituted a small but important division of the exposition. Norton Co., Worcester, Mass., presented a wide range of grinding wheels, cutting off wheels, abrasives, and a line of refractory products. A cutting off machine in operation demonstrated the speed with which steel can be cut by the abrasive method.

Carborundum Co., Niagara Falls, N. Y., and Perth Amboy, N. J., had an extensive exhibit of grinding wheels for all purposes, cutting off wheels, polishing grains and refractories in various shapes. Manhattan Rubber Mfg. Division, Passaic, N. J., operated a cutting off machine in its booth and demonstrated thin wheels for cutting bar and tubular stock and sprues. A complete line of refractories and insulating fire brick was exhibited by the Babcock & Wilcox Co., New York, and a series of tests was conducted to demonstrate their properties.

A GENEROUS portion of exhibit space was devoted to displays of welding equipment and accessories, as well as machines for flame cutting and machining of steel. Union Carbide & Carbon Corp., New York, displayed several types of acetylene generators, regulators and torches, cylinders of oxygen and acetylene and a flame cutting machine in operation.

An affiliated organization, Linde Air Products Co., New York, showed in operation four new types of cutting machines: A small, portable machine known as a secator; a larger machine for stationary use, termed a pantosec; a straight-line cutting machine; and a pipe cutting machine. A portable weld testing machine also was demonstrated, as well as a full line of oxyacetylene welding and cutting devices, welding rods and incidental supplies.

New Torch Cutting Units

The operating exhibit of Air Reduction Sales Co., New York, featured a number of new developments in machines for torch cutting of steel shapes. One of these was designed especially for forming machine parts, bases and the like; another for shape cutting to precise forms and dimensions. A third unit was a semiautomatic machine in which the torch was driven by a magnetic roller contacting with the periphery of a cam or templet of the form required to produce the desired shape. A demonstration in connection with the latter showed how by the addition of a single attachment the machine could be converted for use without the necessity for the magnetic tracing device. In this exhibit also was demonstrated a portable arc welder manufactured by the Wilson Welder & Metals Co. Inc., North Bergen, N. J.

Beer barrels assembled by electric welding with specially developed types of equipment were on exhibition at the booth of the Lincoln Electric Co., Cleveland. Operating displays of automatic and hand welding methods also figured prominently in this exhibit, in addition to samples of weld tests specimens, a variety of types of electrodes for use in connection with welding of steel, cast iron, stainless steel, high-manganese steel and aluminum. Open-type and totally enclosed fan-cooled motors, as well as starters likewise were on display.

A new type of electric arc welder, electric motors and samples of welded materials held attention at the booth of the Harnischfeger Corp., Milwaukee. Both electric and gasoline engine driven arc welders were operated for visitors to the exhibit of the Hobart Bros. Co., Troy, O. A newly developed method for welding electrolytic copper also was demonstrated at the latter booth.

Numerous sizes and types of sweated and electric hydrogen welded steel tubing were shown attractively by Bundy Tubing Co., Detroit. Samples also were displayed to illustrate copper electric hydrogen welding for receiver tanks, floats, spring shackles and similar parts. Supplies and operating equipment for thermit welding were featured in the exhibit of the Metal & Thermit Corp., New York, as well as heavy mineral coated electrodes for electric arc welding. Una Welding Inc., Cleveland, showed an automatic arc welding head, arc welders and welding rods. Engineers in the booth of John A. Roebling's Sons Co., Trenton, N. J., explained uses and applications for the company's line of welding wire.

Production bronze welding was featured in the exhibit of the Bastian-Blessing Co., Chicago, two operators keeping busy continuously in the assembly of oil stove parts, at the rate of several thousand per day. A new timing device for use on spot welders was demonstrated by the Eisler Electric Co., Chicago. Robert E. Kinkead Inc., Cleveland, demonstrated the operation of a new recording instrument which affords accurate measurement of elapsed welding time on a job and actual welding time of one or more arc welding operators.

PROMINENT among exhibits was the variety of alloys developed to meet new industrial requirements. At the booth of Haynes Stellite Co., Kokomo, Ind., for instance, cutting tools of material produced by this company were demonstrated. An engine cylinder block embodying hardfacing material for exhaust valve seats attracted considerable attention. A lathe with a stellite cutting tool operating under the intense heat of an oxyacetylene blowpipe was demonstrated.

The exhibit of New Jersey Zinc Co., New York, revealed an increasing number of zinc die casting applications in the form of machine parts. Cadmium plating was being carried on by Udylite Process Co., Detroit. Moderate sized parts were being processed in a 50-gallon plating tank, with appropriate cleaning, pickling and rinsing facilities. Electric resistor furnaces of the smaller type were in operation at the booth of Hoskins Mfg. Co., Detroit. Heating element alloys and castings also were shown. Alloy furnace castings and retorts were displayed by Electro Alloys Co., Elyria, O. Driver-Harris Co., Harrison, N. J., exhibited heat-resisting alloys in the form of carburizing boxes, cyaniding and pickling containers, furnace parts, and the like.

Die Castings Made

Madison-Kipp Corp., Milwaukee, had a die casting machine in operation. A complete line of air tools also was shown. Alloy castings for various types of heat treating equipment were displayed by General Alloys Corp. Boston. Demonstration of carbon metal arc welding of Everdur metal and oxyacetylene welding using bronze welding rods attracted attention at the booth of American Brass Co., Waterbury, Conn.

A metallizing unit, showing the application of melting, atomizing and depositing various metals, interested visitors at the exhibit of Metallizing Co. of America Inc., Los Angeles. Typical automotive parts machined with cemented tungsten carbide cutting tools were shown by Carboloy Co. Inc., Detroit. Aluminum bronze die castings comprised the exhibit of Aurora Metal Co., Aurora, Ill. A conveyor with cast steel links, de-

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SUPERIOR STEEL CORP., Pittsburgh, announced at the National Metal exposition held in Detroit, Oct. 2-6, its exclusive arrangement with Ludlum Steel Co., Watervliet, N. Y., to roll into stainless strip form material melted by the Ludlum company under the Armstrong patents. This material is known by the tradename "Silcrome."

The Superior company's display in the exposition showed the stages and forms of steel in rolling from billet to finished strip; by steps, the ingot, billet and plain hot-rolled strip sections were shown. Hot-rolled pickled strip, cold-rolled hard temper and cold-rolled annealed samples also were displayed.

Incidentally, the Superior company this year is celebrating its fortieth anniversary.

ADVERTISING PAGES REMOVED

signed for use in connection with heat treating furnaces, was in operation at the booth occupied by Michigan Steel Casting Co., Detroit. An assortment of steel castings was on exhibition at the booth of Detroit Alloy Steel Co., Detroit.

BAUSCH & LOMB OPTICAL CO., Rochester, N. Y., operated metallurgical microscopes including routine metallographic equipment; spectrographic instruments and industrial microscopes. In operation at the exhibit of Tinius Olsen Testing Machine Co., Philadelphia, was a testing unit with a pendulum indicating and recording system. Two new metallographic polishing machines were shown by Eberbach & Son Co. Inc., Ann Arbor, Mich. E. Leitz Inc., New York, presented for the first time in this country a universal photomicrographic apparatus with special arrangement for macrophotography. This instrument also serves as a profile projection and drawing apparatus.

Automatic temperature recorders, potentiometer pyrometers and allied equipment were on display by Leeds & Northrup Co., Philadelphia. A proportioning system incorporating a motor and valve for use in connection with a heat treating furnace to control the fuel supply and thereby the temperature was demonstrated by Minneapolis-Honeywell Regulator Co., Minneapolis. Gogan Machine Corp., Cleveland, demonstrated a direct-reading brinell testing unit. Brown Instrument Co., Philadelphia, exhibited apparatus for automatic control of hardening, tempering, annealing and drawing temperatures.

Show X-Ray Progress

Selected radiographs, diffraction patterns and X-ray studies of heavier industrial pieces were shown by General Electric X-Ray Corp., Chicago. Industrial X-ray equipment for inspection of steel, continuous visual examination of articles on the production line and X-ray diffraction apparatus for metallurgical testing and research were included in the exhibit of Kelley-Koett Mfg. Co. Inc., Covington, Ky.

A nondestructive test and inspection method for determining cracks and other defects in steel was featured at the booth of A. V. de Forest & Associates, New York. A similar magnetic analysis method of inspection was carried out with apparatus by Magnetic Analysis Corp., Long Island City, N. Y.

A new torsion impact machine and stress-strain recorder attracted visitors to the booth of Baldwin-Southwark Corp., Philadelphia. Measurement and control instruments for steel treating; recording potentiometer in operation, and other devices were shown by Foxboro Co., Foxboro, Mass.

Wire Group Talks Industrial Control

SIGNIFICANT features of typical systems of industrial control already in operation in foreign countries, compared with the American idea as expressed in the National Industrial Recovery Act are essentially similar, according to a study made by F. W. Bullock, research student, Harvard School of Business, Cambridge, Mass., and presented at the fourth annual meeting of the Wire association, in Detroit, Oct. 3 to 5.

The operative plan embodied in the act is based upon the principle of industrial self regulation. With the prohibitions imposed by the antitrust laws temporarily suspended, industrial groups are offered every incentive to form combinations, Mr. Bullock contended. By defining the scope and purpose of codes of fair competition, the law has given to industry a workable plan or control organization. To the self imposed police power available to industrial groups, the law has added the entire weight of the federal government, he concluded.

Following presentation of this paper, a discussion of NRA as applied to the wire drawing industry was opened. It was general opinion that more workmen are being employed in wire mills as a result of adoption of the NRA plan, although most operators reported a shortage of wire drawers. In fact, many establishments hiring more men were obliged to engage workmen who knew little or nothing about the wire drawing industry.

Steel Treaters Hear Data On Research Studies

(*Concluded from Page* 32)

grain size and grain growth in steel about to be quenched, Dr. M. A. Grossmann, research engineer, Illinois Steel Co., South Chicago, Ill., stated that in some steel the McQuaid-Ehn grain size is influenced by any prior heat treatment which alters the grain size of the ferrite. This explains, he stated, why cold work sometimes leads to a finer grain size of this type. If the carburizing temperature is above the coarsening temperature of a steel, the final carburized piece will consist partly or wholly of coarse grains. But if the opposite condition exists, the speaker stated, then the austenite grain size will remain unchanged.

Milwaukee Foundry Equipment Co., 3238 West Pierce street, Milwaukee, is making delivery to the Buick Motor Co., Flint, Mich., of a molding machine said to be the largest ever designed. It has a 36-inch cylinder and is operated by pneumatic pressure. Its capacity is 112 molds per hour. The Milwaukee plant, almost idle a year ago, is now operating close to capacity.

Program for Mechanical Engineers' Annual Meeting

(*Concluded from Page* 27)

Kraus, University of Michigan, Ann Arbor, Mich.

"X-Ray Determination of Depth of Cold Working," by L. Thomassen and D. M. McCutcheon, University of Michigan, Ann Arbor, Mich.

Iron and Steel

"Investigating the Performance of Bearing Metals and the Wear on These Metals," by J. R. Connelly, Lehigh university, Bethlehem, Pa.

"Possibilities of Mechanical Control as Applied to Metallurgical Furnaces," by H. J. Velten, H. A. Brassert Co., Chicago.

Mechanical Springs

"Analysis of Stress in a Helical Spring of Circular Wire," by H. C. Perkins, professor, Cornell university, Ithaca, N. Y.

"Elastic Behavior and Creep," by M. F. Sayre, professor, Union college, Schenectady, N. Y.

"Fatigue and Mechanical Properties of Spring Material," by D. J. McAdam Jr., metallurgist, bureau of standards, Washington.

Conference on Steel Houses To Hear Foreign Speakers

A small house conference has been planned to supplement the usual business and technical sessions at the eleventh annual convention of the American Institute of Steel Construction at the Stevens hotel, Chicago, Oct. 19 and 20. The conference will be presided over by F. T. Llewellyn, United States Steel Corp., New York, and will feature addresses by Herr Otto von Halem of Dusseldorf, Germany, director of the organization of German steel companies, and M. L. Icre of OTUA, a similar organization in Paris, France. These foreign authorities will describe steel house designs which have been studied in their respective countries.

Mr. Llewellyn, chairman of the conference, will be remembered for his analysis of the various methods of small steel house construction in this country, presented at a two-day forum on small house construction held by the institute two years ago. He also has supervised the preparation of a comprehensive booklet on steel houses recently issued by the Steel corporation (see STEEL, Aug. 28, p. 36).

Headquarters of the institute are at 200 Madison avenue, New York.

American railroads in 1932 bought iron and steel products to the amount of $100,550,000, of which $15,500 was for steel rails.

WHERE EVERY WELD *must be* A SUPERIOR WELD

Consistently superior welds are an absolute necessity on many fabricating and maintenance jobs. No chances can be taken. Expert welders and welding wire of highest quality must be employed.

It is for such work that Roebling Welding Wire is so widely used. *Specially made* to meet exacting weld requirements, as described below, it is outstandingly pure and uniform. Welds made with this Roebling Wire are characterized by great strength and durability, and *unvarying* high quality.

We would be pleased to have you put this custom-made wire to a test. Samples of either gas or electric types will gladly be supplied by our nearest office on request.

JOHN A. ROEBLING'S SONS CO. - TRENTON, N. J.
Atlanta Boston Chicago Cleveland Los Angeles New York Philadelphia Portland, Ore. San Francisco Seattle Export Dept. New York, N. Y.

WHY ROEBLING WELDING WIRE IS OF EXCEPTIONALLY HIGH QUALITY...

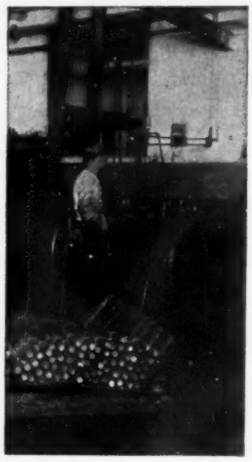
1. It is a custom-made wire; **2.** the steel for it is not made on the ordinary tonnage basis; **3.** it is made in small open-hearth furnaces; **4.** of special melting stock; **5.** and is produced by Roebling's special methods; **6.** painstaking care is exercised throughout manufacture.

ROEBLING

THE CUSTOM-MADE WELDING WIRE—FOR EXACTING WELDERS

Making the Most of

METHODS AND MATERIALS



A PLUG gage test on piston cross bores was conducted in an automotive plant recently to determine which of several sources was supplying the best gages. Only chromium plated gages were used—all were of uniform accuracy, but they varied in quality of finish. Each gage was photographed at 100 diameters and used under identical conditions. The piston pin hole was 0.8587 inch diameter with a tolerance of plus 0.0005 and minus 0.0000 inch. Permissible wear tolerance of the plug was 0.0001 inch. The gage with the poorest finish, which was in reality an excellent ground gage, lasted for 6400 pistons, as compared with 78,000 for the best gage, which had a smooth lapped finish. The difference in cost between the poorest and best gage was about 35 per cent, but on the basis of service, the manufacturer was justified in specifying the higher priced gage.

\$ \$ \$

The cylinder block of a logging railway locomotive which had cracked badly was repaired recently with about 5 linear feet of bronze welding. It is estimated that this job, which took but a day's time, saved the management more than \$400.

\$ \$ \$

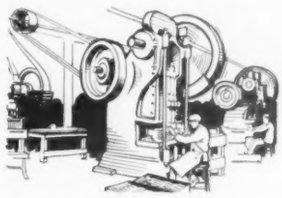
SEVERAL large bus and truck manufacturers have standardized on stellited exhaust valve seats in their engines. Tests have shown no regrinding or refinishing of the valves to be necessary after runs of 100,000 to 150,000 miles, and the seating surfaces remained in good condition. The valve seats are of the threaded removable type with the layer of abrasion-resistant alloy being applied by the oxyacetylene process. After welding, the seat is rough ground and then threaded on the outside and provided with serrations on the inside. Next, it is locked in place in the counter bore by setscrews or dowels, and a high-speed grinding wheel, held concentric with the valve stem, is used to finish the hard-faced seating surface.

\$ \$ \$

One of the most widely used alloy steels for drop forging die blocks comes within the following composition range: Carbon 0.50-0.70, manganese 0.40-0.80, chromium 0.60-1.30, and nickel 1.00-2.00 per cent. Nickel-chromium-molybdenum steel die blocks have been increasing in popularity, and a typical composition from one of the leading die block manufacturers is as follows: Carbon 0.55, manganese 0.60, nickel 1.50, chromium 0.70 and molybdenum 0.20 per cent.

\$ \$ \$

Use of a wooden paddle in removing finished parts from a large press in an automotive parts plant recently saved both hands of an operator. The press was operated by two men, one feeding and the other taking away the backing plates. The feeder in front was protected by a harness de-



vice, while the man in the rear used wooden paddles to remove the finished parts. The ram screw broke, causing the die to fall unexpectedly. Since the wooden paddle was completely demolished, it is easy to imagine what would have happened if the man had been removing the heavy parts from the die with his two hands.

\$ \$ \$

Before removing the risers from 4 to 6 per cent chrome steel castings with the cutting blowpipe, the entire casting should be brought to a good black heat, about 900 degrees Fahr., because the steel is more ductile at this temperature than at room temperature. Since, however, this steel is air-hardening above 1000 degrees Fahr., care must be exercised to keep the preheating below this temperature. When the casting has been raised to the proper heat, the gates and risers can be removed by the usual method without fear of cracking the casting. The cut should be made as close to the body of the casting as possible to minimize grinding, or enough clearance can be left to allow for a subsequent machine cut.

\$ \$ \$

Nickel-chromium cast iron, containing 1.0-2.5 per cent nickel and 0.5-1.25 per cent chromium, is particularly useful as a growth-resistant material under oxidizing conditions over a wide temperature range.

\$ \$ \$

ALTHOUGH subjected to daily service in hot sulphuric acid or cold muriatic acid, monel metal pickling baskets purchased over ten years ago by a northern Ohio manufacturer are still in first class condition. These baskets are used for pickling small stampings, forgings and castings preparatory to enameling, galvanizing or tinning. A few of the baskets are 17 years old.

\$ \$ \$

A new development consists of a special pig iron, a synthetic product of the open-hearth furnace, for the benefit of foundrymen who have been troubed with broken castings in the cleaning room. The metal contains a little copper, 0.10 per cent phosphorus, 2.40 per cent silicon, 0.70 per cent manganese, and total carbon 3.40 per cent. The tensile strength is 37,000 pounds per square inch and the metal runs freely in the ordinary 0.10-inch section found in stove foundries and shops devoted to the production of light, thin castings. Fracture of the metal shows a dark uniform grain particularly adapted to polishing or enameling.

\$ \$ \$

A machine shop in one of the central states, through aid of the oxyacetylene welding process, has been able to develop a procedure for reclaiming broken automobile reamers. While at present the practice is limited to this particular type of reamer, there seems to be no reason why industrial reamers should not be similarly repaired. These reamers cost from \$2.50 up to \$16 each and can be reclaimed by bronze welding at an average cost of about 40 cents. The process is applicable whether the reamers have only one blade or more than one.

--Photo courtesy Mid-West Forging Co., Chicago

Hundreds of thousands of advertising sign stands have been manufactured in the past decade and have required several thousand tons of steel. One type of stand for a rectangular sign is shown at the left and other type for a circular sign is shown at the right. The signs themselves usually are made of steel having a finish of porcelain enamel

LARGE USES OF STEEL IN SMALL WAYS

250th Article ◆ Sign Stands

ADVERTISING signs have experienced a mushroom growth in the United States during the past decade, more than keeping pace with the increase in number of business establishments. While steel demand has benefited from the many billboards and various types of electric signs which have been erected, it also has been stimulated by the extensive use of the smaller sidewalk type of signs. The latter came into prominence a few years ago, after moderate popularity previously and since have found widespread adoption.

Probably the largest users of sign stands are gasoline filling stations, although lunch rooms, theaters, laundries, chain stores and other establishments, also employ them. A large part of the popularity of sidewalk signs may be traced to the automobile, not only because of their extensive application at service stations, but also because their design lends them to easier view to the occupants of a car than do overhead signs. Located at filling stations, they may be moved about as desired, and the signs themselves are changed easily. Hundreds of thousands of sign stands have been manufactured, according to one maker, requiring several thousand tons of steel.

Steel is the principal material used in fabricating this product, typical examples of which are shown in the accompanying illustration. Designed to withstand wind pressure, the construction necessarily is heavy, most of the weight being concentrated in the base. The circular base shown in one type is 27 inches in diameter, made up of a rim with three cross pieces. In making the base, a steel bar, 2 x ¾ inches is formed into a circle and welded, with cross pieces, which are bars 2 x ½ inches, welded to the inside circumference. The flange piece is drop forged, tapped for the upright, and welded to the cross pieces. Pipe, 20 inches long and 1⅝ inches in outside diameter, is threaded and screwed into the flange.

Flexible Rim for Sign

The rim which holds a 30-inch diameter sign has a V-shaped cross section about 1⅝ inches wide and 5/32-inch thick, in order to retain the sign. Brackets are welded to the rim and attached to the pipe upright by machine bolts. The rim is not solid, permitting it to be spread for the removal or insertion of a sign. Signs are made of steel, usually being the enameled type. The complete stand weighs 63 pounds, the base accounting for 50 pounds. This type of stand also is furnished in weights down to 39 pounds, the base rim and cross pieces in such instances being made of smaller-section bars.

Stands for use with rectangular signs, also shown in the illustration, employ curved channels for the base, while the frame likewise is made of channel sections formed from steel strips and welded together. In certain designs one end of the frame base is hinged so that the entire frame may be tilted to the horizontal and the sign removed. A typical stand taking a sign plate 20 x 28 inches has a total height of 33 inches and a width of 21½ inches with 1½-inch channel sections used in fabricating the base. Weight is about 15 pounds.

Insulating Brick Suitable For Heating Furnaces

Johns-Manville, 22 East Fortieth street, New York, is promoting the use of its C-22 insulating brick as a firebrick replacement up to a temperature of 2000 degrees Fahr. The brick weighs 37 pounds per cubic foot and at a mean temperature of 1000 degrees Fahr. has a conductivity of 1.88 B.t.u. per square foot per degree temperature difference per hour. Crushing strength cold is 745 pounds per square inch.

The brick is recommended for use in oil and gas-fired furnaces, electric furnaces of the resistance type and where directly exposed to furnace heat source or gases but not where exposed to mechanical abrasion and slag action. A suitable silica-base cement has been developed for bonding the brick where it is installed in furnaces without firebrick lining. The cement also can be used as a wash coating when a harder and more impervious face is desired.

Builds Generators for Dam

Contract has been awarded by the bureau of reclamation for the first of two electrical generators, claimed to be the world's largest both electrically and physically, for installation at Boulder dam, Boulder City, Nev. General Electric Co., Schenectady, N. Y., is preparing to begin construction of the machines which will be leased to and operated by the city of Los Angeles. The first unit is scheduled for installation early in 1935.

For All Your
TOOL ROOM GRINDING JOBS

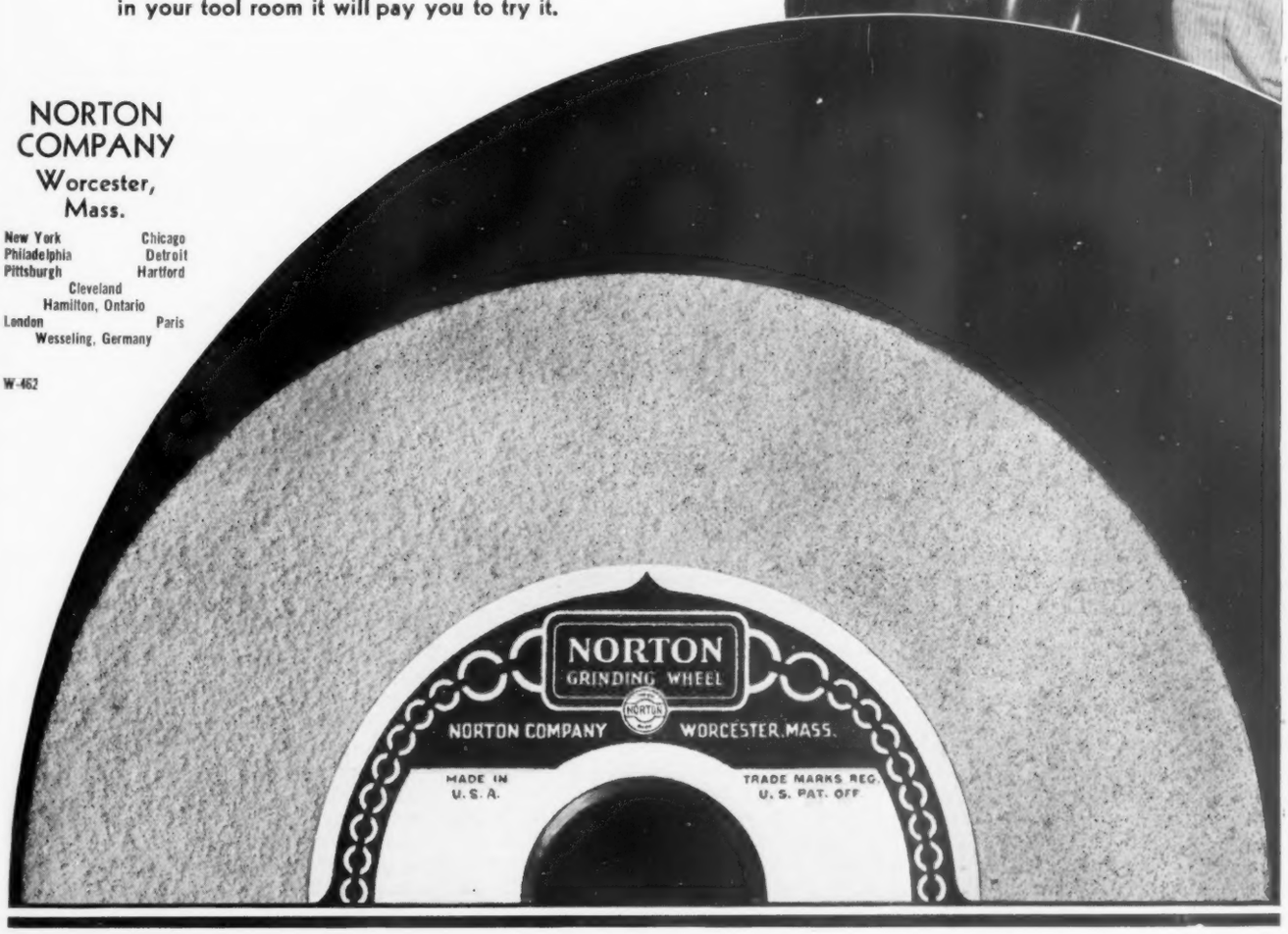
You'll Like the Norton "B" Bond Wheel

WITH tool room men everywhere the Norton "B" bond "white wheel" is becoming increasingly popular. They like its fast, free cutting action with no tendency to burn . . . even on the hardest die steels and alloys. They like the way it holds its shape and size . . . the few dressings that are necessary.

There are three mighty good reasons for the success of the Norton "white wheel." In it are combined three important Norton features:

1. 38 Alundum abrasive—hard, sharp and free cutting.
2. "B" bond—a much improved type of vitrified bond.
3. Controlled Structure—positive regulation of grain spacing to give the best grinding action for each job.

If you are not already using the Norton "white wheel" in your tool room it will pay you to try it.



NORTON COMPANY
Worcester, Mass.

New York, Chicago, Philadelphia, Detroit, Pittsburgh, Hartford, Cleveland, Hamilton, Ontario, London, Paris, Wesseling, Germany

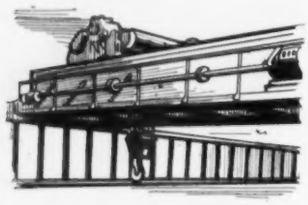
W-462

PROGRESS IN STEELMAKING

PERFECTION of a new galvanizing flux, which contains the frothing agent in the proper proportion, has led many galvanizers to abandon the use of sal ammoniac. The new compound effects a 20 per cent saving, produces a minimum amount of fume, and eliminates the danger of spitting and, consequently, the loss of molten zinc. The product is particularly suited to the galvanizing of pipe, wire and sheets.

♦ ♦ ♦

Changes in the design of rotating cam limit switches for use with automatic sheet and tin mill feeder and catcher table control systems have been effected. To meet the need for greater precision on the tilt table drives, the new design has split cams arranged in pairs to give any adjustment between 4 to 8 degrees in the shortest cam and 180 to 360 degrees on the longest cam, without removing or cutting the cam.



HOW long can antifriction bearings on a traveling crane be operated on one application of grease, based on a safe temperature? The duration of such a campaign now is being determined at the plant of an Ohio steelmaker who has installed a thermostat in two crane bearings of this type. When the thermal device warns the craneman that the bearings have reached a predetermined temperature, the bearings will be inspected; if their condition is found satisfactory, the setting of the thermostat will be changed to a higher temperature, and without adding any grease, the crane will be kept in service until the life of the bearings are determined.

ECONOMICAL use of mixed coke oven and blast furnace gases for heating open-hearth furnaces is essentially a matter of preheating the gases, which in turn depends upon the behavior of the regenerators, according to tests conducted at a German steelworks. Based on these and other tests, gas and air chambers should be constructed separately and accessible from all sides and with little likelihood of gas leaking into the air chamber. Large gas chambers are recommended. The ratio of the air chamber to the gas chamber should be unity or only slightly larger. Both chambers, including the roof and uptakes, should be inclosed in gas-tight castings and the roof insulated for efficient operation.

♦ ♦ ♦

Washed coal gives a coke with the ash content of practically the same percentage in both the domestic and metallurgical grades. In fact, many blast furnaces are using a mixture of these two grades of fuel in the burdens without any apparent adverse effect on the smelting process or grade of iron.

♦ ♦ ♦

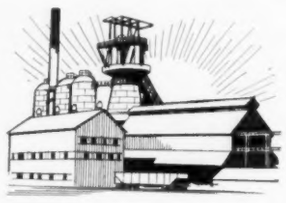
Accurate cutting of black plate packs into multiples at the rate of 50 tons per 8-hour turn, is the purpose of a newly developed shear. The unit requires only one operator who, without moving from his position, can adjust the shear to any range of tin mill sizes. Pattern sheets also can be sheared from the pack to uniform dimensions with a minimum scrap loss. An important feature contributing to successful performance of this unit is a tension roller conveyor. While a multiple is being sheared the tension rollers pass over the steel and draw the pack immediately and accurately against stationary squaring edges.

♦ ♦ ♦

Valves and fittings in modern high-pressure steam plants, which are operated at temperatures above 900 degrees Fahr. and pressures above 1300 pounds per square inch, now are being made of alloy steel containing 5 per cent of chromium.

♦ ♦ ♦

Marked external blistered or porous crowns on the surface of open-hearth ingots occur when calcined lime is used in the charge, according to an investigation conducted by German steelmakers. When raw lime is used in the heats, the ingots always are free from these defects.



INCREASING the efficiency of blast furnace stoves 40 per cent or more has been accomplished by the installation of refractory inserts which maintain velocities throughout the checker chamber and cause turbulence and intimate contact between the gases and the exposed surfaces of the brickwork. On a set of stoves where these new inserts increased the heating surface from 88,000 to 132,000 quare feet per stove, the average monthly stack temperature was reduced from 760 to 235 degrees Fahr. and the average temperature of the hot blast increased 210 degrees Fahr.

Services of *STEEL* relative to the Iron and Steel Industry Code of Fair Competition

Steel Code Prices and Extras

TODAY the most important item of business before consumers, distributors and sellers of iron and steel is mastery of the new price schedules filed under the terms of the recently approved Code. Confusion will attend the negotiation of all contracts until the intricacies of the new price structure are interpreted intelligently, digested thoroughly and reduced to routine procedure throughout the industry.

Uniform extras covering all materials produced by iron and steel companies under the code of fair competition have now been compiled by the American Iron and Steel institute for official distribution. Until the official extras were released by publication of the institute's book, all price extras which had been published must be considered as tentative, and subject to correction.

The official extras also are presented in the seventh edition of the Standard Handbook of Price Extras, published by STEEL and *Daily Metal Trade*, 1213 West Third Street, Cleveland.

In presenting promptly and completely all pertinent information on prices and extras, STEEL is actuated by the same motive which caused it to take the lead in expanding its Washington service, in introducing "Windows of Washington", and in sending four experienced observers (in addition to its resident editor) to cover the Steel Code hearing. It is the same motive which prompted STEEL, in the issue of August 28, to present the text of the approved Code in full, with annotations showing every important change from the original draft.

STEEL is alert to your requirements in this hour of adjustment to new methods. Rely upon it for the information and interpretation necessary to enable you to work intelligently under the new rules of your business!

E. L. Shaner, Editor

Steel Code Booklet

STEEL printed and has available, in handy booklet form (68 pages plus loose chart) the official "Code of Fair Competition for the Iron and Steel Industry" as approved by The President on August 19, 1933.

The Code consists of 12 Articles and eight Schedules.

Also included in this booklet is Title 1 of the National Industrial Recovery Act—"to encourage national industrial recovery, to foster fair competition—"

A Table of Contents provides easy reference.

The loose chart on Basing Points for Iron and Steel Products is well arranged for ease of reference.

This is the official Code, *as is*, and not the tentative Code submitted by the American Iron and Steel Institute in July.

Price:—25 cents per copy, delivered. Address Book Department, Penton Publishing Co., Penton Bldg., Cleveland.

Steel Code in Pamphlet Form

The August 28 issue of STEEL carried the complete "Code of Fair Competition of the Iron and Steel Industry", as approved by The President on August 19, 1933.

This presentation of the Code *as is*, shows in **black face type** all *additions* to the original draft of Code as submitted by the American Iron and Steel Institute to N R A in July.

Also, there appears *in italics*, editorial annotations regarding eliminations and changes from the tentative code as submitted.

This article presents the complete Code *as is*, at the same time indicating all additions, changes and eliminations from the tentative Code. This avoids all confusion between the two Codes (Tentative and Official) and at the same time gives all information as to changes.

This is the only copy of the Official Code so far presented in this manner. In pamphlet form (16 pages). Free to subscribers, on request.

STEEL
Cleveland, Ohio

Date.....

Please send ..... free reprints of the annotated Steel Code as published in STEEL August 28, 1933.

Please send ..... books of the complete Code of Fair Competition of the Iron and Steel Industry at 25c per copy.

Enter {1 year —$4.00 / 2 years—$6.00} subscription to STEEL, beginning.....

Name.....

Address..... O.K. By.....

Bill to.....

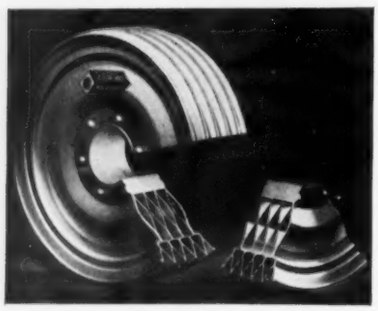
New Industrial Motors Are Self-Synchronizing Type

Columbia Electric Mfg. Co., 1292 East Fifty-third street, Cleveland, has developed a line of small and medium capacity synchronous motors to meet a wide range of industrial requirements. These units may be installed as easily as ordinary induction motors, and since their starting and pull-out torques are practically the same as those of squirrel cage motors they may be applied to almost any drive. These motors are self-synchronizing and separately excited. They give a leading power factor of 0.9 on full load, and have therefore good power factor correction characteristics. The poles are fitted with amortisseur windings to assure high torque while starting.

◆

V-Belt Drive Ratings Are Increased

Allis-Chalmers Mfg. Co., Milwaukee, has announced that its V-belt drives now are available from ¼ to



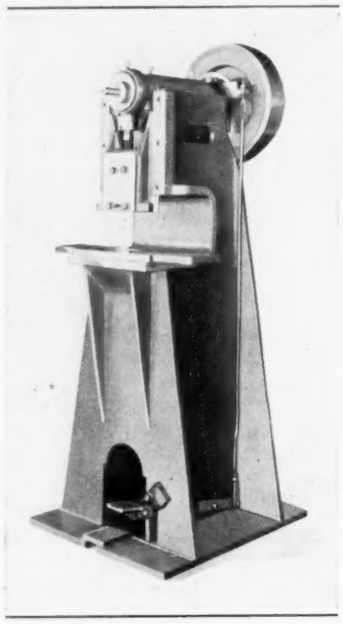
Grid-type construction features Allis-Chalmers Texsteel sheaves

15 horsepower. Texsteel sheaves are grid-type construction, as illustrated, with accurately formed heavy gage steel sections electrically welded at web and rim. Integral bushings or solid bored hubs are standard; sheaves are well balanced and light in weight.

◆

Adds High-Speed Unit to Punch Press Line

Service Machine Co. Inc., 754 Broadway, Elizabeth, N. J., recently developed a 10-ton welded steel frame press, shown herewith, as an addition to its line of deep-throat punch presses. The unit operates at a maximum speed of 250



Welded steel frame press designed by Service Machine Co.

revolutions per minute and is designed particularly for medium punching and stamping operations, while the deep-throat design of the housing permits handling work of large area.

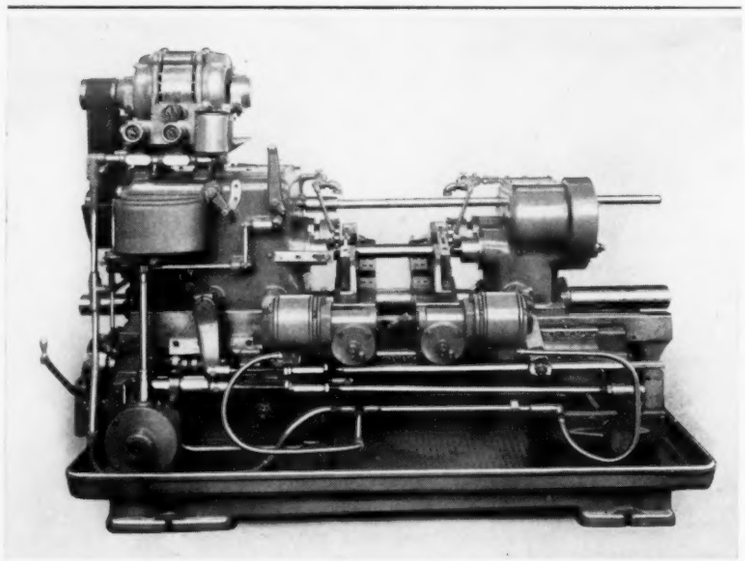
Eccentric can be interchanged quickly for various lengths of stroke by removing the nut on the front of the shaft. The end of the shaft carrying the eccentric is tapered to secure close fitting of this part. Any stroke can be provided up to a maximum of 1½ inches, the standard stroke being 1 inch. Adjustment of the slide is 2 inches. With the standard stroke of 1 inch the maximum shut height of the P-23 press is 7½ inches and the P-23A is 12 inches.

◆

Develops Double-End Milling And Centering Machine

Jones & Lamson Machine Co., Springfield, Vt., is marketing an automatic double-end milling and centering machine for milling to length and centering to uniform depth, both ends of shafts, stem gears and similar pieces preparatory for turning operations. Right-hand milling head is adjustable on the ways of the machine with a lead screw located on the back. Both work supports are adjustable so they can be located to grip forgings or shafts in a convenient position. By loosening two clamp screws, these work supports can be moved longitudinally on the center bar of the machine to accommodate various lengths of work.

Nine different feeds ranging from 3 to 22 inches per minute can be obtained with the pick-off gears located in the feed gear housing. The unit, shown below, is built in various bed lengths with maximum distance between milling cutters of 20, 32, 44, 62 and 80 inches. The work is clamped in hardened V-blocks by electric torque motors operated by a conveniently located drum switch.



Jones & Lamson automatic double-end milling and centering machine has variable speed headstock

Steel Rate Rises on Rush to Fill Contracts

Reduction Now Anticipated, with Lighter Specifications and New Purchasing—Strikes No Longer Factor—Larger Shape Tonnages—Coke Up

SPEEDING up production to complete specifications on expiring contracts by Oct. 15, as required by the steel code, resulted in a 2-point advance in steelworks operations to 40 per cent last week.

This acceleration, however, does not measure consuming demand. Due largely to the fact the automobile industry is beginning the changeover in models, and that users generally have just taken in large stocks, the prospects now are for a rather sharp reduction.

New releases on fourth quarter contracts and spot purchasing are exceptionally light. Comparatively little tonnage remains to be rolled on third-quarter contracts. In a few days, therefore, the industry will be working entirely under the price provisions of its code.

Coke Higher, Presaging Advance in Pig Iron; Other Adjustments in Progress

Further price advances in some iron and steel products appear likely, following a rise of $1.25 to $2 a ton in standard grades of furnace and foundry coke, which is expected soon to exert an influence on pig iron.

Nut and bolt manufacturers are preparing to increase their prices for November. An important producer of stainless steel has reduced base prices for bars, plates and shapes, but the introduction of quantity extras leaves the net prices to consumers little changed. Some revisions in alloy bar differentials are under consideration.

Warehouses are putting in effect a new plan resulting in specific delivered prices in every city. Prices will be based at the nearest mill, plus warehouse price differentials, plus less-carload freight to point of consumption.

Closing of larger structural shape tonnages, which placed 15,386 tons on mill books last week, is being expedited by the expiration of price protections, also to a larger extent by action on public works. Over the next three months 40,000 tons of steel will be released for Mississippi river improvements. Actual awards include 4500 tons for a dam at Alma, Wis. In a tentative stage at Chicago is a plan to spend gasoline tax funds to build 160 miles of elevated highways, which eventually would require 1,280,000 tons of steel, principally shapes.

Federal financing of bridge reconstruction work in the Buffalo district has developed requirements for nearly 8000 tons of shapes and concrete bars. Early award of 13,000 tons of structurals for the New York postoffice is assured. The New York port authority is taking bids on 2000 tons of nuts and bolts.

In plates, too, some larger tonnages are in prospect. For a gasholder at Omaha, Nebr., 3000 tons have been placed, and 4000 tons are pending for a gasholder at Washington. For watermains at Cleveland, 2000 tons have been awarded. Navy and coast guard work will take 8200 tons. Recent inquiries for barges at Pittsburgh, however, have lapsed.

Rail mills appear in no hurry to respond to Co-ordinator Eastman's suggestion for a price of $35 a ton or less, and it now seems they will not meet that figure. In the meantime railroad material releases are slow. The Northern Pacific is reported to have placed 12 locomotives with the American Locomotive Co.

Ford, Warming Up Open Hearths, in Market For Basic; Scrap Trend Still Downward

Ford is warming up four open-hearth steel furnaces preparatory to opening the rolling mill at Fordson, and is informally inquiring for 10,000 tons of basic iron. Pig iron shipments for the month are shrinking below the September level. Scrap prices still are soft, with the tendency downward. In some districts the spread between scrap and basic iron prices now is unusually wide.

Strikes, at least for the present, are no longer a factor affecting steelworks operations. In the Wheeling district the steel rate advanced 10 points to 45 per cent; New England, 20 to 95; Detroit, 9½ to 55; Pittsburgh, 2 to 40; Youngstown, 2 to 57; and Chicago, 1 to 49. At Cleveland the rate was down 8 points to 46; eastern Pennsylvania, down 5 to 26½; Birmingham, 4 to 30; while Buffalo was unchanged at 29 per cent.

STEEL's iron and steel price composite is off 1 cent to $31.59; the finished steel composite is unchanged at $49.20; while the scrap index is down 12 cents to $10.46.

COMPOSITE MARKET AVERAGES

	Oct. 14	Oct. 7	One Month Ago Sept., 1933	Three Months Ago July, 1933	One Year Ago Oct., 1932	Ten Years Ago Oct., 1923
Iron and Steel Composite	$31.59	$31.60	$31.30	$29.81	$29.32	$43.84
Finished Steel Composite	49.20	49.20	48.52	47.20	47.64	67.77
Steelworks Scrap Composite	10.46	10.58	10.83	10.66	6.96	14.25

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Oct. 14, 1933	Sept. 1933	July 1933	Oct. 1932
Finished Material				
Steel bars, Pittsburgh	1.75	1.60	1.60	1.60
Steel bars, Chicago	1.80	1.65	1.70	1.70
Steel bars, Philadelphia	2.04	1 91	1.91	1.91
Iron bars, Chicago	1.60	1.60	1.65	1.65
Shapes, Pittsburgh	1.70	1.60	1.60	1.60
Shapes, Philadelphia	1.90	1.81½	1.65	1.75
Shapes, Chicago	1.75	1.65	1.70	1.70
Tank plates, Pittsburgh	1.70	1.60	1.60	1.60
Tank plates, Philadelphia	1.88	1.79½	1.49½	1.79½
Tank plates, Chicago	1.75	1.65	1.70	1.70
Sheets, No. 10, blue anneal., Pitts.	1.75	1.70	1.75	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.10
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2 85	2.80
Sheets, No. 10, blue anneal., Gary	2.00	1.90	1.90	1.80
Sheets, No. 24, hot ann., Gary	2.35	2.35	2.35	2.20
Sheets, No. 24, galvan., Gary	2.95	2.95	2.95	2.85
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	2.10	2.05	1.95
Tin plate, per base box, Pitts.	4.65	4.65	4.25	4.75
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	Oct. 14, 1933	Sept. 1933	July 1933	Oct. 1932
Pig Iron				
Bessemer, del. Pittsburgh	19.26	19.26	17.86	15.76
Basic, valley	17.00	17.00	15.60	14.00
Basic, eastern, del. eastern Pa.	17.76	17.76	16.79	13.60
No. 2 foundry, del. Pittsburgh	18.76	18.76	17.36	15.76
No. 2 foundry, Chicago	17.50	17.50	16.75	15.50
Southern No. 2, Birmingham	13.50	13.50	12.60	11.00
No. 2X, Eastern, del. Phila.	18.63	18.63	17.28	14.01
Malleable, valley	17.50	17.50	16.10	14.50
Malleable, Chicago	17.50	17.50	16.75	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.04	23.04
Gray forge, del. Pittsburgh	18.38	18.26	16.93	15.63
Ferromanganese, del. Pittsburgh	87.24	87.24	84.44	73.24
Scrap				
Heavy melting steel, Pittsburgh	$12 25	13.00	12.70	9.50
Heavy melting steel, Chicago	10.25	10.70	12.00	7.25
Heavy melting steel, Chicago	9.75	10.00	10.45	6.00
No. 1 wrought, eastern Pa.	10.75	11.60	13.00	7.25
No. 1 wrought, Chicago	9.25	9.25	10.20	5.60
Rails for rolling, Chicago	11.25	11.25	11.15	8.00
Coke				
Connellsville, furnace, ovens	3.75	2.50	2.40	2.00
Connellsville, foundry, ovens	4.25	3.15	2.85	2.75

CURRENT FINISHED STEEL PRICES

Prices conform to American Iron and Steel Institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88½c
New York, del.	2.08c
Phila., del.	2.04c
Birm., base	1.90c
St. Louis, del.	2.07c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.90c
Gary, base	2.00c
Chicago, del.	2.03½c
Phila., del.	2.19c
New York, del.	2.23c
St. Louis, del.	1.97c
Birm., base	2.05c
F.o.b. cars, dock Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38½c
New York, del.	2.58c
Phila., del.	2.54c
Birm., base	2.40c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98½c
Phila., del.	3.14c
New York, del.	3.18c
Birm., base	3.00c
St. Louis, del.	3.17c
San Fran., f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.82c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Gary, base	2 40c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Gary, base	2.85c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pitts., No. 10	2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract	$4.65
Do., stock	4.05
Long ternes, No. 24 unassorted	2.90c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
*Bars	17c	18.5c	21c	26c
*Plates	20c	21.5c	24c	29c
*Sheets	25c	28c	31c	35c
*Hot Strip	17c	18.5c	21c	26c
*Cold Strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del.	1.98c
Phila., del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birm., base	1.85c
Coatesville, base	1.80c
Sparrows Point, base	1.80c
Pac. Coast, f.o.b. cars, dock	2.25c
St. Louis, del.	1.97c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birm., base	1.85c
Pac. Coast, f.o.b. cars, dock	2.25c
Do., wide flange	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birm., base	1.90c
Buffalo, base	1.85c
Pac. Coast ports, cars, dock, c.i.f.	2.10c
Cleveland, base	1.80c
Philadelphia, del.	2.04c
Boston, del.	2.19c
New York, del.	2.08c
San Fran., f.o.b. cars, dock	2.30c
Pitts., forg. qual.	1.85c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Chicago, base	1.60c
Philadelphia, base	1.74c
Pitts., refined	2.70c to 7.50c

REINFORCING
New billet

Pittsburgh, cut lengths	1.90c
Chicago, Youngstown, O., Birmingham, Ala., Cleveland, Buffalo	1.95c
Gulf ports	2.20c
Pacific coast ports	2.35c
Phila., del.	2.19c

Rail steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Gary, Ind., Youngstown, O.	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices apply on carload lots. Mixed carloads 10 cents higher; joint carloads up 20 cents; less carloads up 30 cents. Nail extras subject to 10 per cent discount on straight or mixed carload shipped to single consignee.)

Base, Pitts.-Cleve.
(Per 100 lb. keg)

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized fence wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.10c

Anderson, Ind., and Chicago, $1 over Pitts.-Cleve.; Duluth, $2 higher; Birmingham, Ala., $3 higher.

Spring wire	3.10c

Chicago and Waukegan $1 higher. Worcester $2 higher.

Cold-Finished Bars □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Chi., Cleve., Buff., 5c up; Detr., 20c up; East. Mich., 25c up.

Shafting □ □

(Turned and ground)
Pittsburgh base.

1⅛-inch	3.25c
1⅛ to 1½-inch	2.75c
1⅝ to 1⅞-inch	2.60c
1¹⁵⁄₁₆ to 2⅞-inch	2.45c
2¹⁵⁄₁₆ to 6-inch	2.30c

Alloy Steel □ □

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O., 2.45c. F.o.b. Bethlehem, Pa., 2.55c.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 .15 to .25 Mo.			0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.			1.05
5100 .80-1.10 Cr.			0.45
5100 Cr. spring			0.20
6100 bars			1.20
6100 spring			0.95
Cr., Ni., Van.			1.20
Carbon van.			0.95
9250 (flats)			0.25
9250 (rds., sq.)			0.50

Strip and Hoops □

Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.75c
Do., Chicago	1.85c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip Pitts., Cleve.	2.40c
Worcester, 3 tons or over	2.60c

Rails, Track Material □

Stand. rails, mill	$40.00
Relay rails, Pitts. (Gross Ton)	
20-45 lbs.	$24.50
50-75 lbs.	$20.00
80-100 lbs.	$23.50
Light rails, billet qual., Pitts., and Chicago	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R., Pitts.	2.40c
Track bolts, base	3.40c
Tie plates, Pitts.	1.90c
Tie plates, Chi.	1.90c

Base, railroad spikes 200 kegs or more; base tie plates, 20 tons or more; differentials for less.

Base, light rails, 25 to 40 pounds; 50 to 60 pounds inclusive, $5 extra; 16 and 20 pounds, $1 extra; 12 pounds, $2 extra; 8 and 10 pounds, $5 extra.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	73 off
Rolled thread, ½ x 6 and smaller	73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	73 off
Tire bolts	60 off
Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller, 73 off.	
Step Bolts	70 off
Elevator bolts	70 off

NUTS

Semifinished	73 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Rivets, Wrought Washers

Struc. c.l., Pitts-Cleve.	2.50c
Struc., c.l., Chi.	2.60c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 5 off

Wrought washers, mill 6.00 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pitts.	1.90c
Steel piling, Buff.	2.00c
Steel piling, Chi.	2.00c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Gary, Ind., Lorain, O., to consumers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3⅝	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts, same as for hot rolled below. Charcoal Iron—Under 10,000 pounds; 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	44
2½—2¾	34	4	46
3	41	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing discounts apply.)

Hot Rolled

2—2¼	33	3¼—3½	50
2½—2¾	40	4	52
3	47	4½, 5, 6	42

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$35.00-36.00
4-in., Birm.	38.00-39.00
4-in., Chicago	46.00-47.00
6 to 24-in., Chicago	43.00-44.00
6-in. & over, N. Y.	34.50-36.50
4-in. New York	36.50-38.50

Class A pipe $3 over Class B. Stand. fitgs., Birm. base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

RAW MATERIAL PRICES

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25

Gross Tons

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$17.50	$18.00	$17.00	$18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
From Swedeland, Pa., del. to Phila.	18.26	18.76	17.76	.....
From Bethlehem, del. to Brooklyn..	19.77	20.27	.....	.....
From Bethlehem, del. to Newark, N. J.	18.99	19.39	.....	.....
Basing Point:				
Everett, Mass	18.00	18.50	17.50	19.00
From Everett, del. to Boston	18.00	19.00	18.00	19.50
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	18.50	19.00	18.00	19.50
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh	(Neville Island base, plus 50 to 76 cents switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O...	19.26	19.26	18.76	19.76
Basing Point:				
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee..	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	(Granite City base, plus 56 to 75 cents switching charges)			
Basing Point:				
Birmingham, Ala.	13.50	.....	12.50	.....
From Birmingham del. to:				
Boston	18.12	.....	17.62	.....
Newark, N. J.	18.51	.....	.....	.....
Brooklyn, N. Y.	19.39	.....	.....	.....
Baltimore	18.02	.....	17.52	.....
Cleveland	19.64	.....	18.64	.....
Cincinnati	18.23	.....	17.11	.....
Chicago	18.16	.....	19.14	.....
St. Louis	17.62	.....	17.50	.....
Basing Point:				
Provo, Utah	16.50	.....	.....	.....

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$22.00. Basing point: Johnson City, Tenn.—.....

Philadelphia, standard and copper bearing..... 23.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson County, O., base: 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base: 10%—27.25; 11—$28.75; 12—$30.25; 13—31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con.(nom.)	8.00- 9.00
Cop-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50
No. Afr. low phos.	7.00
Swedish basic, 65%	8.00
Swedish low phos.	8.50
Spanish, No. Afr. basic, 50 to 60%	7.00
*Tungsten, spot, sh. ton unit, duty pd.	$13.60-13.80
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$17.00-18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasion, 52-55%	22.00
So. African, 52%..	21.00-22.00
So. Afr., 49-51%....	20.00-21.00
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet E. Chicago	54.00
Birmingham, Ala.	55.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 and 5 per cent grade

Washed gravel, duty paid, tide, gross ton	$20.00
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$14.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts. and Chicago	1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

*Connellsville fur.	$3.75
*Connellsville fdry.	4.25
Connell. prem. fdry.	4.50
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi. ov., outside del.	8.00
Chicago, del.	8.75
New England, del.	10.50
St. Louis, del.	8.25
Birmingham, ovens	4.75
Indianapolis, del.	8.75
Ashland, Ky., Connells., basis	5.50
Portsmouth, ovens, Connell. basis	5.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†	27.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb con. del.	9.50
Do, spot del.	10.00
*Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton., frt., all., lb.	7.00
Do, under 1 ton	7.50
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Bars

Mills Ship Against Forward Contracts—Revision of Alloy Bar Differentials Considered

BAR PRICES, PAGE 46

Cleveland—Beginning this week the bulk of current shipments will be on the new fourth quarter contracts, mills having completed practically all deliveries on third quarter arrangements by Oct. 15. These new contracts were closed at 1.65c, base, Cleveland, prior to the $3 a ton advance. Specifications are light, and there is little new buying at 1.80c. Some producers believe the percentage form of contract, under which most of the new arrangements were written, may tend to accelerate releases toward the end of a month, as unspecified tonnage is automatically canceled at the close. Rivet manufacturers are seeking adjustment in code regulations applying to bars. Formerly they could buy bars purposely sold for certain sizes of rivets; under the new size differentials they are required to pay $1 to $2 a ton more than under the former system. In less-carload shipments of some finished steels now it is not uncommon for a consumer to receive different prices from various producers, due to individual interpretations of code resolutions, which some sellers say are ambiguous.

Pittsburgh—Purchase of merchant steel bars since the beginning of October have been light but production in this district on expired third-quarter contracts was heavy last week. The new base of 1.75c, Pittsburgh, has been tested on minor sales. Although the alloy bar base remains 2.45c, Pittsburgh, and other basing points with the exception of Bethlehem, Pa., some revision in the alloy differentials is under consideration. This would change the net price on hot-rolled alloy bars and in turn cold-drawn alloy bars because the latter take a 50-cent per 100 pounds extra over hot-rolled base.

Chicago—While soft steel bar business is moderately heavier, specifications are lighter and backlogs have been reduced over the past several weeks. Automotive orders are light and little business for new model requirements has been received. International Harvester Co. is increasing operations to provide additional jobs. Implement sales have continued light despite a moderate pick-up in prices of farm products. Soft steel bars continue 1.80c, with rail steel bars 1.70c. Bar iron continues 1.60c, so far not having followed the recent $3 a ton advance in steel bars.

Boston—A few carlot orders for bars at old prices are being specified, one interest taking 400 tons for forging from a midwest mill. Industrial consumers are not active. Business at 1.85c, Buffalo, is nil and consumers covered by contracts are not expected to specify much until near the close of next month.

New York—Sellers of commercial steel bars are looking for car buying and further navy work to provide the next important impetus to buying. They expect November to be at least moderately brisk as a result. It is true that much of such car business as may result, is protected at contracts placed prior to the recent advance; nevertheless, release of specifications should be substantial and unexpected requirements might make for an impressive tonnage. The market is 1.75c, Pittsburgh, or 2.08c, New York. Common iron bars still are being quoted by most sellers at 1.78c, New York.

Philadelphia—Steel bar sellers are pinning their hopes largely on railroad equipment buying this fall. Fair ship tonnage is coming along, but it is scarcely important enough to make a dent in the general dullness that now prevails. The market is 2.04c, Philadelphia, with common iron bars tending upward but still available to the larger buyers at 1.74c, Philadelphia.

Plates

Releases of Fourth Quarter Requirements Light—Places Tonnage for Gas Holders

PLATE PRICES, PAGE 46

Pittsburgh—Plates are moving slowly and prospects are fading for much of the recently discussed river-barge work materializing. Although continued reports are heard of barge work, which will require several thousand tons, the fact that many builders have withdrawn low prices the past ten days without buyers taking advantage of them, more or less precludes buying of much consequence soon making an appearance. Inquiry for ten coal barges, requiring 1600 to 1700 tons of plates, for a buyer at Cincinnati has lapsed. Only about 300 tons in three small barges is considered actively pending. Midland Barge Co., Midland, Pa., bid $1895 each for two steel needle flats to the Cincinnati engineers recently. Each requires about 25 tons of plates. Low bid for a similar craft bought at Pittsburgh last January was $1540. Plates have received only minor test at the new 1.70c, Pittsburgh, price.

Chicago—Gas holder construction involves large plate tonnages, one taking 3000 tons having been placed at Omaha, Nebr., while another requiring 4000 tons is pending at Washington. Oil company purchases involve small lots for improvement work rather than for extensions of production facilities. Awards include 300 tons for tanks for the Commercial Solvents Co. at Terre Haute, Ind.; 300 tons for storage tanks in east Texas, and 250 tons for a fuel tank at Omaha, Nebr. Inquiries for brewery tanks are less active and construction of some plants is deferred by lack of funds. Several small orders have been placed for distillery tanks in this district. Plates are 1.75c, Chicago.

Cleveland—Plate mill operations here have dropped about 10 points to around 50 per cent, with most specifications on third quarter contracts filled by Oct. 15, as provided by the code. New releases on fourth quarter contracts are light. Some machine tool builders have purchased small lots recently. Award of 2000 tons of plates for Cleveland water-mains has been made to Alco Products Inc., New York, with 2500 tons for another section of the main to be awarded. National Tube. Co. took a small lot of 24-inch pipe for the project.

Boston—Demand for plates at 1.80c, Coatesville, Pa., is light, orders being in small spot lots. Most volume on the books from this territory was placed at 1.70c for specifying during the remainder of the year. Railroads are taking little plate tonnage. Another 300-ton brewery tank job is up in the Boston district.

Philadelphia—Navy and coast guard work, requiring approximately 8820 tons of plates, on which, as previously noted, bids are being opened this month, constitutes the best prospect for new plate business this month. Inquiry for 12 locomotives from the Northern Pacific, requiring possibly 600 to 700 tons of plates, and of which at least a portion may be built in the East, is regarded in some quarters as a forerunner of

substantial requirements of railroad equipment later in the fall. Miscellaneous buying includes 120 tons of tanks for a local brewery. Prices are unchanged at 1.80c, Coatesville, Pa., or 1.88½c, Philadelphia. Contrary to the general trend, a leading plate producer put on an additional open hearth furnace last week.

Contracts Placed

3000 tons, gas holder, Omaha, to Stacey Bros. Gas Construction Co., Cincinnati.

2000 tons, Cleveland watermains, to Alco Products Inc., New York; 2500 tons still to be awarded.

1090 tons, tanks, Texas Co., Ogdensburg, N. Y., to Hammond Iron Works, Warren, Pa.

400 tons, tanks and pipe work for American Potash & Chemical Co., Trona, Calif., to unnamed interest.

300 tons, storage tanks, Dancinger Refining Co., Texas, to Graver Tank & Mfg. Corp., East Chicago, Ind.

300 tons, tanks, Commercial Solvents Co., Terre Haute, Ind., to Graver Tank & Mfg. Corp., East Chicago, Ind.

250 tons, fuel tank, Metropolitan Utility Co., Omaha, Nebr., to Graver Tank & Mfg. Corp., East Chicago, Ind.

120 tons, tanks, Henry F. Ortlieb Brewery Co., Philadelphia, fabrication contract to Downington Iron Works, Downington, Pa., with plates to an unnamed producer.

Contracts Pending

2500 tons, mostly plates, 10,000,000 cubic foot gas holder for Washington; bids now being taken.

1200 tons, mainly plates, for three coast guard cutters; Pusey & Jones Corp., Wilmington, Del., lowest.

300 tons, tanks, Choice Foods Inc., brewery, Boston.

250 tons, estimated, water tank, Lexington, Mass.; application made for federal loan.

125 tons, one small oil cargo barge for Mississippi river use, for the Pure Oil Co., Chicago.

Unstated, 2200 feet 24-inch and 1100 feet 30-inch 5/16-inch pipe, for Seattle Fifth avenue S. W. improvement; bids soon.

Cold Finished Buying Lags

Cold Finished Prices, Page 47

Pittsburgh—The tie-up of Detroit district tool and die programs has greatly restricted buying of cold-finished steel for 1934 models. Shipments to certain other consuming lines are fairly steady but jobbers for the time being are out of the market, as well as the automobile manufacturers. Bases of 1.95c, Pittsburgh, and 2.00c, Cleveland, Chicago and Buffalo, are holding. It will likely be late in the quarter before an advance in cold-finished to conform with the hot-rolled bar advance is made. This will come at a time when the hot-rolled price at 1.75c, Pittsburgh, will carry greater significance.

Sheets

New Prices Applied on Further Automotive Purchases—Output Slows as Specifications Fall

SHEET PRICES, PAGE 46

Pittsburgh—The advanced price of 2.75c, Pittsburgh, base on No. 20 cold rolled sheets was tested last week by the entrance into the market of an important body-builder with specifications covering several thousand sheets. Some bodybuilders still have material due them on third quarter contracts. It has been impossible for some to find space to stock all of the sheets they had contracted. Shipments are continuing this week on unfilled third quarter balances. There is little feature to trading in the common grades of sheets. Galvanized are firm at 2.85c, Pittsburgh; and black, 2.25c.

Cleveland—Additional orders for automotive sheets have been placed at the new prices. While these are mainly for rounding out stocks, sellers say little resistance to the new price schedules has been encountered. Heavy purchasing for new models, however, is not expected to develop until November. The strike in Detroit is reported to be delaying preparations for these models. Mill schedules eased off last week at the approach of the Oct. 15 deadline for shipping on third quarter contract specifications, and will be still lower this week. Miscellaneous consuming lines are buying sparingly.

Chicago—Sheet production continues heavy and shipments of all tonnages specified against old contracts are not expected to be completed for a short time. New business is quiet. Heavier orders from automotive companies are expected in connection with production of new models, while the outlook in the agricultural implement industry still is rather unfavorable. Some sheet users are covered on requirements a short time ahead with material received against previous contracts, although speculative buying has not been extensive.

Boston—Jobbers covered on sheets rather heavily, but with few exceptions industrial demand is quiet. Buyers have been pressing for delivery, and one mill hampered by labor trouble is reported to have transferred some business to another interest.

New York—Sheet buying continues spotty, with most consumers still operating on tonnage placed last quarter. Some improvement in building, however, is expected to be reflected soon in a better demand for galvanized sheets. Prices are unchanged at 2.85c, Pittsburgh, for galvanized; 2.25c for No. 24 black; 1.75c for No. 10 hot rolled; 2.30c for No. 10 cold rolled; and 2.75c for No. 20 cold rolled, with the delivered prices on car lots including the 33-cent freight rate.

Philadelphia—With sheet mills completing most of their shipments last week against last quarter contracts, sellers here look for easier operations for a while, as new tonnage has been coming out slowly. Possibly the most consistant buyers of sheets are stove manufacturers. Early announcement is expected with regard to protests of eastern autobody manufacturers, who are adversely affected by Resolution No. 13. Prices are unchanged.

Cincinnati—District sheet production sagged during the past week when new orders failed to offset the virtual exhaustion of backlogs. The American Rolling Mill Co., Middletown, O., has announced plans to distribute stainless steel sheets, strips and plates of its own manufacture.

St. Louis—Except for moderate improvement in demand for galvanized roofing material in the South, the market for sheets is quieter. Shipments are on a liberal scale, but new buying has fallen to a low ebb.

Birmingham, Ala.—New business is not coming in as actively as expected, and output has been reduced slightly.

Strip

New Price Levels Are Tested; Shipments Well Sustained

Strip Prices, Page 47

Pittsburgh—One seventy-five base, Pittsburgh, on hot-rolled strip has been tested on several sales recently as has the advanced price of 2.40c, base, Pittsburgh or Cleveland, on cold-rolled strip. Shipments on third-quarter contracts continue heavy mills being from ten days to two weeks behind on delivery. Cooperage hoop is quoted 1.85c base, Pittsburgh.

Cleveland—Sales this month are lighter than in the comparable September period. Shipments have been well sustained by the completion of third quarter contracts. Though Oct. 15 was the code deadline for such shipments, most producers were unable to fill all specifications, and they

will be completed as rapidly as possible. Small lots have been placed at the new prices of 1.75c, Pittsburgh, for hot-rolled, and 2.40c, Cleveland for cold-rolled.

Chicago—Strip production remains fairly heavy, recently averaging around 50 per cent, but quietness in new business points to an early decrease in this rate, since shipments against old contracts now are nearly completed. A fair number of new orders for cold-rolled has been received, with automotive interests so far doing but little buying in connection with new models. Hot-strip is 1.85c, Chicago, with cold-rolled quoted 2.40c, Pittsburgh-Cleveland.

Boston—Some cold strip mills were unable to ship all third quarter business before Oct. 15; most of this volume taken before the advance to 2.60c, Worcester, was cleared. New buying is light. Consumers have a few blanket contracts. Mills ask for early release in some instances and protection against an advance in price. Cold rollers have stocked hot strip heavily.

New York—Most consumers of cold-rolled strip, particularly manufacturers of toys and electrical devices, are well covered on their holiday requirements. As a result demand for both hot and cold-rolled has slowed down materially, cold rollers buying lightly of hot strip. Prices are unchanged at 1.75c and 2.40c, Pittsburgh, respectively, for hot and cold-rolled, with the carlot freight rates from Pittsburgh, 33 cents.

Philadelphia—Strip sellers are finding it difficult to build up new tonnages. Hot strip is unchanged at 2.04c, Philadelphia, and cold at 2.69c.

Railroads

Revised Prices Being Studied; New Developments Expected

Track Material Prices, Page 47

Steel rail producers still are weighing in balance the price they will file on rails to the federal co-ordinator of transportation for the 844,525 tons of rails which 47 railroads have promised to purchase providing a price adjustment is made. Rail producers do not feel entirely sympathetic toward the proposed cut in spite of the volume offered.

Little indication is given of the probable extent to which producers will lower the price of rails in keeping with the federal request. Meanwhile, interest is centered on Washington where some developments in the buying program momentarily are expected.

In addition to 10,000 tons of rails, Norfolk & Western opens bids Oct. 18 on about 3600 tons of tie plates, 3000 kegs of spikes and some tubular goods for shipment to Roanoke, Va. Under the setup, as dictated by the interstate commerce commission and the new steel code regulations, it would appear this tonnage would of necessity have to go to a West Virginia mill. Except for a bare minimum tonnage placed with producers affected by the Clayton act, the Pennsylvania has done little if any buying.

Car Orders Placed

Alaska railroad, ten 50-ton convertible ballast cars; Pacific Car & Foundry Co., Seattle.

Alaska railroad, ten 30-yard dump cars; Western Wheel & Scraper Co.

Locomotives Placed

Beaver Valley, Beaver, Pa., one 35-ton gear-driven gasoline locomotive, to Plymouth Locomotive Works, Plymouth, O.

Hillsboro & Northeastern, Hillsboro, Wis., one 35-ton gear-driven gasoline locomotive, to Plymouth Locomotive Works, Plymouth, O.

Northern Pacific, 12 passenger lomocomotives reported to American Locomotive Co., New York.

Rail Orders Placed

Toronto, Hamilton & Buffalo, 1500 tons to Algoma Steel Corp., Sault Ste. Marie, Ont.

Car Orders Pending

United Fruit Co., 20 flat cars for export.

Pipe

Federal Loans Spur Municipal Projects—To Close Soon on Cast Tonnage in East

PIPE PRICES, PAGE 47

Chicago—Little improvement is noted in cast pipe awards and inquiries, despite efforts to commence proposed work in various municipalities. The Chicago sanitary district has been granted a loan of $8,000,000 to finish work in this district. Orders for pipe were placed more than a year ago, but work was suspended because of the lack of funds. Pending pipe tonnages are large but there is little indication of the amount of work which will be started before the end of the year. Prices are unchanged with some increase in prospect.

Pittsburgh—Fair demand continues for boiler tubes, especially from railroads with maintenance programs now under way. With no line pipe business and both lap and butt-weld demand failing to expand, tube mill operations in this district are probably more curtailed than any other steel finishing department.

Cleveland—For the fabricated steel part of Cleveland watermains, 2000 tons of plate work has been awarded Alco Products Inc., New York, with 2500 tons remaining to be placed. A small tonnage of the 24-inch pipe for this project has been purchased from National Tube Co., Pittsburgh. Pipe requirements generally are light.

Boston—Townsend, Mass., closes Oct. 20 on a large tonnage of coated centrifugal cast pipe, the heaviest inquiry in months. Providence, R. I., is also likely to buy about 6000 tons of cast pipe before the end of the year. Smaller inquiries are out for Manchester, N. H., and New London, Conn., the latter a federal sewage project. Steel pipe buying continues light.

New York—Cast pipe buying is light. Inquiry is small and limited to a few state projects most of which range from 100 to 200 tons. Considerable municipal volume is held up by lack of funds, but several may go ahead with federal loans.

Birmingham, Ala.—Awards are few and pipe mills still lag in operation, production being less than 40 per cent of capacity. Shipment of pipe is equal to production by reason of no surplus being stocked. Tennessee Valley Authority has placed order for 3800 feet of 8-inch, cement lined cast-iron pressure pipe with National Cast Iron Pipe Co., to be used on the Norris dam construction.

Cast Pipe Placed

600 tons, Massapequa, N. Y.; to R. D. Wood & Co., Florence, N. J.

145 tons, 4, 6 and 8-inch, class 150, for Bremerton, Wash., and Redmond, Wash., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

6000 tons, 24-inch and under, Providence, R. I.; federal loan approved for water system and city will take bids soon.

1600 tons, 6 to 12-inch, Townsend, Mass.; bids Oct. 20.

325 tons, Fort Meade, Md.; bids Oct. 27.

250 tons, 30-inch and under, classes A and D, Manchester, N. H.

Structural Shapes

Tonnage Rises with Increased Activity in Public Work—4500 Tons Placed for Alma, Wis., Dam — Mississippi Projects to Bring Out 40,000 Tons in Three Months

STRUCTURAL SHAPE PRICES, PAGE 46

Chicago—Structural awards of 7000 tons are headed by 4500 tons, including 2000 tons of piling, for the Alma, Wis., dam. Steel for similar projects at Fountain City, Wis., and Canton, Mo., is to be placed soon. For a dam at Chama, N. Mex., 1250 tons has been ordered. Mississippi river dam work will be productive of about 40,000 tons of shapes, piling, plates and concrete bars during the next three months, bids to be taken by Jan. 1 by United States engineer offices at Rock Island, Ill., and St. Paul. Chicago proposes to spend part of its share of state gasoline tax receipts over a 25-year period for building 160 miles of elevated highways radiating from the loop. The projects, still only tentative, would take 8000 tons of steel per mile, it is estimated.

Pittsburgh—Aside from state highway bridges and breweries, the structural market provides little prospective work. A large number of awards last week were driven in from general contractors who were required to buy their steel before higher prices went in effect. Structural shapes are firm at 1.70c base, Pittsburgh, on all new business. Bids for the Hogsett locks near Gallipolis, O., taking 2500 tons, go in Oct. 17. Contractors are purchasing 1500 tons additional for two lock and dam jobs in this district.

Cleveland—Although plain material prices are firm at 1.60c, base, Pittsburgh, closing of many small jobs pending in this district is delayed by builders "shopping" for lower fabricated prices, the fabricators' code not yet having been approved, and competition continuing keen. A tentative award of the general contract for a state, federal-aid bridge at Leavittsburg, O., has been made, involving approximately 600 tons. Ohio will take bids Oct. 20 on bridges requiring 200 tons.

Boston—Structural steel outlook is brighter with bridges and public works representing the majority of projects for figuring. New England fabricating shops are doing little as most of the recent bridge lettings have gone outside the district. Plain material now is 1.80c, Bethlehem, Pa., but most buyers are covered on a minimum percentage basis at 1.70c.

New York—Early action on the award of 13,000 tons for the Manhattan postoffice annex is expected. New York state continues to bring out new bridge inquiry, although most contracts are for small tonnages. Plain structural material holds at 1.80c, eastern mill.

Philadelphia—The largest structural orders placed in this district during the week total slightly over 800 tons. New inquiry is negligible. Shapes are 1.80c, Bethlehem, Pa., or 1.90½c, delivered Philadelphia.

Buffalo—Between 4000 and 5000 tons of structural shapes and 2000 to 3000 tons of reinforcing bars will be purchased as a result of this county's having obtained a $3,000,000 allotment of federal funds for bridge replacement.

Contracts Placed

4500 tons, dam, Alma, Wis.; 2500 tons of shapes to McClintic-Marshall Corp., 2000 tons of piling to Bethlehem Steel Co., Bethlehem, Pa.; through United Construction Co., Alma, general contractor.

3400 tons, eye-bars, anchorage for Golden Gate bridge, San Francisco, to Columbia Steel Co., San Francisco. This is formal placing of tonnage previously reported in the general barge awards.

1250 tons, dam, Chama, N. Mex., to American Bridge Co., Pittsburgh.

1000 tons, including 400 tons of H-columns, pier at Santa Barbara, Calif., for Pacific Western Oil Co., to foreign mill.

600 tons, Wisconsin Co-Operative Brewery Inc., Milwaukee, to Wisconsin Bridge & Iron Co., Milwaukee.

500 tons, piling, six dams, United States engineer, Memphis, Tenn., to Inland Steel Co., Chicago.

Shape Awards Compared

	Tons
Week ended Oct. 14	15,486
Week ended Oct. 7	14,984
Week ended Sept. 30	26,981
This week in 1932	6,712
Weekly average, 1932	14,285
Weekly average, 1933	14,287
Weekly average, Sept.	14,365
Total to date, 1932	629,570
Total to date, 1933	600,053

500 tons, state bridge, Greer county, Oklahoma, to Virginia Bridge & Iron Co., Roanoke, Va.; Keliher Construction Co., Dallas, Tex., general contractor.

500 tons, grandstand, Texas Breeders' and Racing association, Houston, Tex., to McClintic-Marshall Corp., Bethlehem, Pa.

450 tons, distillery, Allied Mills Inc., Peoria, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

425 tons, state bridge, Barbersville, W. Va., to Wheeling Structural Steel Co., Wheeling, W. Va.

420 tons, highway bridge, Port Royal, Va., to Virginia Bridge & Iron Works, Roanoke, Va.

400 tons, state highway bridge, Barbersville, W. Va., to Wheeling Structural Steel Co., Martins Ferry, O.

400 tons, bridge, Clark county, Ohio, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

400 tons, industrial building, E. I. du Pont de Nemours Inc., Deepwater, N. J., to Belmont Iron Works, Philadelphia.

375 tons, state bridges, Gregg and Gonzales counties, Texas, to Houston Structural Steel Co., Houston, Tex.; Thomas & Ratliff, Rogers, Tex., general contractors.

370 tons, highway bridge, Miles City, Mont., to Minneapolis-Moline Power Implement Co., Minneapolis.

330 tons, Flambeau river bridge, Wisconsin, to Wisconsin Bridge & Iron Co., Milwaukee.

300 tons, bridge, Coin, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

300 tons, state bridge, Pocohontas county, Arkansas, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

260 tons, state highway work, project E-99-E, Arizona, to unnamed interest.

260 tons, state bridge, Saco river, Biddeford-Saco, Me., to American Bridge Co., Pittsburgh; Cyr Bros. Co., Waterville, Me., general contractor.

250 tons, industrial building, Publicker Commercial Alcohol Co., Philadelphia, to Morris Wheeler & Co., Philadelphia; this is in addition to 400 tons reported as going to this fabricator several weeks ago for Publicker expansion.

250 tons, piling, Metropolitan Utility Co., Omaha, Nebr., to Inland Steel Co., Chicago.

232 tons, state bridges, Guadalupe and Bexar counties, Texas, to Alamo Iron Works, San Antonio, Tex.; O. Speer, Alvord, Tex., general contractor.

225 tons, state bridge, Landaff, N. H., to McClintic-Marshall Corp., Bethlehem, Pa.; Kittredge Bridge Co., Concord, N. H., general contractor.

200 tons, American Distilling Co., Pekin, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

185 tons, bridge, Vergennes, Vt., to Carnegie Steel Co., Pittsburgh; B. A. Barton Construction Co., Ticonderoga, N. Y., general contractor. Albany Steel & Iron Supply Co., Albany, N. Y., awarded reinforcing steel.

165 tons, two projects, one involving two buildings for Charles Lenning Co., Philadelphia, manufacturing chemist, and the other including garage and other miscellaneous buildings for the state of Pennsylvania, Lockhaven, Pa., to Belmont Iron Works, Philadelphia.

155 tons, state bridges, Kendall and Bexter counties, Texas, divided among Alamo Iron Works, San An-

tonio, Tex., and Southern States Steel Co., Dallas.; D. H. Buchanan Construction Co., Temple, Tex., general contractor.

140 tons, state bridge, Bowden, W. Va., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

126 tons, state bridge, project NRH 98-D, Arizona, to unnamed interest.

100 tons, church, Greenwich, Conn., to Belmont Iron Works, Philadelphia.

Contracts Pending

40,000 tons including piling and concrete bars, estimated, 14 upper Mississippi river dams; bids over remainder of year to United States engineer offices, St. Paul and Rock Island, Ill.

6000 tons, municipal auditorium, Kansas City, Mo.; bids which were to have been opened this month have been indefinitely postponed.

4000 to 5000 tons, Erie county (Buffalo) N. Y., bridge replacement program; 70 projects; bids soon.

3800 tons, Coos Bay bridge, North Bend, Oreg.; plans approved by war department.

2500 tons, four cranes for navy department, Pearl Harbor, T. H., specification 7419; bids Nov. 15.

1000 tons, lock No. 16, Muscatine, Iowa.

775 tons, twin locks, Big Kanawha river near Winfield, W. Va.; Dravo Contracting Co., Pittsburgh, general contractor.

750 tons, highway bridges, Arkansas.

730 tons, highway bridge, Lake City, Ark.

500 tons, technical high school, Springfield, Mass.; bids in.

500 tons, bridge, Mystic river, Medford, Mass.; Lee Construction Co. low.

400 tons, bridge, Phillipsburg, Kans.

350 tons, postoffice, Cambridge, Mass.; John Bowen Co., Boston, low, granite; Coath & Goss, Chicago, low, limestone.

300 tons, state bridge, Holland Creek, Ala.; bids soon.

300 tons, state highway bridge, Liberty, Ind.

250 tons, brewery, Joplin, Mo.

200 tons, state highway bridge, Noblesville, Ind.

180 tons, piling, Duluth; bids to superintendent of lighthouses, Detroit.

150 tons, state armory, Westfield, Mass.

140 tons, highway bridge, Friendship, N. Y.: Bunte Contracting Co., Corning, N. Y., low for general contract.

130 tons, Lawrenceville, N. Y., highway bridge; Frank Hanssel Buffalo, low for general contract.

130 tons, state bridge, Farmington, Conn.; bids in.

125 tons, dormitory, state school, Concord, N. H.; D'Amore Construction Co., Boston, low.

116 tons, highway structures, Custer county, Idaho, for bureau of public roads; bids Oct. 13.

100 tons, postoffice, Malone, N. Y.; David Gordon Building & Construction Co., New York, low.

100 tons or more, marine hospital, Portland, Me.; R. W. Erickson, Philadelphia, low.

100 tons, warehouse, Eastern States Milling Co., Buffalo; bids in.

Harrison Radiator Corp., Lockport, N. Y., has given its 1000 employes a second wage increase, making a total advance of 15 per cent since June 1.

Concrete Bars

Demand Improves In Some Districts—2000 Tons Up for 70 Bridge Replacements In Buffalo Territory — States Still Slow in Releasing Projects—Prices Are Firm

REINFORCING BAR PRICES, PAGE 47

Pittsburgh—Base prices are firm on new billet steel bars and rail steel bars for reinforcing purposes. David-Smith Co., Pittsburgh, is low for construction of four new units for the Marine hospital, Pittsburgh, on a bid of $150,555. An unstated tonnage of reinforcing bars is required. Booth & Flinn Co., Pittsburgh, are buying about 500 tons of rail steel bars for the substructure to the Grand Island bridges, Buffalo. Close to 1000 tons of mesh is required in two current Pennsylvania state highway lettings.

Cleveland—State road work and small, miscellaneous projects provide a fair volume of concrete bar orders, with prices firm. In addition to 800 tons for the Cleveland easterly sewage disposal plant, still pending, 1000 tons will be required for the plant's digester tanks, plans for which are being prepared.

Chicago—Concrete bar demand is coming principally from state and federal projects. A large tonnage will be required for 14 upper Mississippi river dams, while 300 tons have been placed for the Alma, Wis., dam. Some delays still are encountered in the road program for Illinois. Billet bars continue 1.95c for cut lengths, with rail steel bars 1.80c.

New York—Reinforcing steel requirements for bridges and highways are heavy, a good tonnage of mesh being placed. Billet bars for commercial building are inactive at 1.95c, Pittsburgh, for cut lengths.

Boston—Concrete reinforcing bars are more active. The largest award includes 400 tons for Fenway Park grandstand, Boston. Bridges, highways and a Manchester, N. H., reservoir account for close to 600 tons. Prices are unchanged, with rail bar rerolling mills in this territory on a 1.80c, Buffalo, base for reinforcing material.

Philadelphia—Five hundred tons of bars are involved in two openings this week on roadwork for Pennsylvania, and 400 tons for roadwork in New Jersey next week. A substantial tonnage, mainly bar joists, will be active soon for a housing development at Tacony park, this city. Billet steel bars are 2.19c, Philadelphia.

Concrete Awards Compared

	Tons
Week ended Oct. 14	6,965
Week ended Oct. 7	7,516
Week ended Sept. 30	2,887
This week, 1932	2,633
Weekly average, 1932	3,920
Weekly average, 1933	3,612
Weekly average, Sept.	3,365
Total to date, 1932	173,910
Total to date, 1933	151,716

Contracts Placed

2400 tons, rail steel, sewer, Buffalo, to Kalman Steel Corp., Bethlehem, Pa.; through Chippewa Plumbing Co.

580 tons, superstructure for Grand Island (Buffalo) bridges, to unstated interest.

450 tons, 50,000 squares noncorrosive wire fabric, flood control work, United States engineer, Vicksburg, Miss., to Copperweld Steel Co., Glassport, Pa.; bids Sept. 2.

400 tons, grandstand and bleacher additions, Fenway Park, Boston, to Joseph T. Ryerson & Son Inc., Boston; Coleman Bros. Inc., Boston, general contractor.

331 tons, delivery to Panama for navy department, to Kilby Car & Foundry Co., Anniston, Ala.; opening of Oct. 5.

300 tons, dam, Alma, Wis., to Paper Calmenson Co., St. Paul.

235 tons, state bridges, Greenville and Oconee counties, South Carolina, 175 tons to Knoxville Iron Co., Knoxville, Tenn., and 60 tons to Virginia Steel Co., Richmond; Palmer Construction Co., Florence, S. C. general contractor.

232 tons, state highway work, project NRH 98-D, Arizona, to unnamed interest.

230 tons, highway, Suffern-Mt. Ivy, Rockland county, New York, to Truscon Steel Co., Youngstown, O.; through DeBlasio Construction Corp.

210 tons, highway, Ireland Corners-New Paltz, Ulster county, New York, to Pittsburgh Steel Co., Pittsburgh; through Harp & Conway Construction Corp.

200 tons, state overhead crossing, San Bernardino county, California, to unnamed interest.

200 tons, highway, Rhode Island, to Wickwire Spencer Steel Co., Buffalo; Callan Construction Co., general contractor.

190 tons, state bridge, Brookline, Mass., to Joseph T. Ryerson & Son Inc., Boston; Coleman Bros. Inc., Boston, general contractor.

178 tons, state highway work in five counties, Montana, to unnamed interest.

145 tons, city conduit, Muscatel avenue,

Los Angeles, to unnamed interest.

130 tons, state bridge, Greer county, Oklahoma, to Carter-Waters Corp., Kansas City, Mo.; Keliher Construction Co., Dallas, Tex., general contractor.

130 tons, bridge for Florida East Coast railroad at Bunnel, Fla., to unstated interest.

120 tons, highway, route 29, section 11, Hunterdon county, New Jersey, to Truscon Steel Co., Youngstown, O.

119 tons, state bridge and overpass, Apache and Navajo county, Arizona, to unnamed interest.

115 tons, highway, Erie boulevard, Syracuse, N. Y., to American Steel & Wire Co., New York; through Syracuse Paving & Contracting Co. Inc.

100 tons, two state highway projects, Moffat county, Colorado, to unnamed interest.

100 tons, state highway work in five counties in California, to unnamed interest.

100 tons, bridges, Pulaski, Va., to Virginia Steel Co., Richmond, Va.; through M. S. Huggins.

Contracts Pending

2200 tons, Coos Bay bridge, North Bend, Oreg.; plans approved by war department.

2000 to 3000 tons, Erie county (Buffalo) N. Y., bridge replacement program; 70 projects; bids shortly.

1200 tons, miscellaneous steel, principally bar joists, $1,300,000 housing project for Hill Creek Development Co., Tacony park, Philadelphia, Wark Co., Philadelphia, general contractor, to issue specifications shortly.

1000 tons, mesh, two Pennsylvania state highway lettings, Oct. 19 and Oct. 20, at Harrisburg, Pa.

500 tons, miscellaneous Pennsylvania state road jobs; bids to be opened at Harrisburg, Pa., Oct. 19 and 20.

500 tons, culverts, Lake Okeechobee, Fla.; Northern Construction Co., St. Petersburg, Fla., low for general contract.

450 tons, crest gates, lower Cumberland river dams; bids to United States engineer, Memphis, Tenn., Oct. 16.

400 tons, federal reform school, Chillicothe, O.

400 tons, New Jersey state road work; bids at Trenton, N. J., Oct. 23.

350 tons, municipal power plant, Springfield, Ill.; C. E. Carson Co., Chicago, awarded general contract.

325 tons, state bridges, Revere-East Boston, Mass.; bids Oct. 17.

218 tons, San Gabriel dam No. 2, Los Angeles county, California; bids Oct. 9.

190 tons, highways and structures, North Carolina; bids Oct. 18.

183 tons, state highway work in Santa Barbara county, California; bids Oct. 25.

170 tons, highways, Connecticut.

150 tons, reservoir, Manchester, N. H.; C. & R. Construction Co., Boston, low for general contract.

150 tons, hurricane gates, Lake Okeechobee, Fla.; E. H. Latham Co., Niles, O., low on general contract.

148 tons, siphon for metropolitan water district, Los Angeles; bids Oct. 30.

107 tons, tw'n locks, including gates, Big Kanawha river near Winfield, W. Va.; Dravo Contracting Co., Pittsburgh, general contractor.

100 tons, highways and other work, Camp Devens, Mass.

Unstated tonnage, four units for new Marine hospital, Pittsburgh; David-Smith Co., Pittsburgh, low on general contract at $150,555.

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Ore Companies Prepare To Open Underground Mines

Iron Ore Prices, Page 48

Cleveland—Leading iron ore mine operators are preparing to resume production at underground mines Nov. 1, giving work to miners two to three days a week. Shipments this season have come mainly from open pit mines, which will be down during the winter, and from the stockpiles at underground mines, which have been idle. Both Oliver Iron Mining Co. and Pickands, Mather & Co. have announced three-day schedules for open pit mines in the Michigan territory. Production will be heavier than last winter, it is certain, but the rate will depend largely upon requirements as they appear during the winter months.

Dock balances at Lake Erie ports are 207,443 tons less than last year, as shown by the following report from the Lake Superior Iron Ore association, giving receipts and shipments for the season, and stocks Oct. 1:

Port	Receipts	Shipments	Dock bal. Oct. 1, '33
Buffalo	1,021,652	652	2,625
Erie	508,188	521,955	87,161
Conneaut	2,093,862	1,940,090	1,840,460
Ashtabula	1,466,330	1,516,148	1,490,775
Fairport	799,568	820,900	387,735
Cleveland	3,492,687	2,550,517	848,855
Lorain	1,642,079	1,078,182	12,931
Huron	376,578	353,595	346,290
Toledo	558,280	313,933	16,741
Total	11,959,224	9,095,972	5,033,573
1 year ago	1,793,977	1,887,370	5,241,016

Receipts for the season at other than Lake Erie ports are:

Port	Tons
Detroit	366,169
Indiana Harbor	738,691
Gary	1,069,156
South Chicago	1,326,804
Hamilton, Ont.	71,426
Total	3,572,246
Comparative, 1 year ago	547,833

Philadelphia—The largest contract for foreign iron ore in approximately two years has been signed by an eastern Pennsylvania consumer. The total exceeds 20,000 tons. The ore is to come from Africa.

Pig Iron

Spot Buying Only Feature—First-Quarter Books Not Yet Opened; Price Rise Expected

PIG IRON PRICES, PAGE 48

Pittsburgh—Advance of $1.25 per ton in furnace coke in quantities and up to $2 a ton in small lots will affect merchant iron producers. Although the present schedule of prices, Neville Island, Pa., and Sharpsville, Pa., bases, is quoted firmly and unchanged on minor buying, it is to be expected that with this advance in fuel costs, producers will be forced to follow suit. The present market is quoted $18, Neville Island, Pa., for foundry grades, with 50 cents under this base for basic and 50 cents over for bessemer.

Cleveland—In negotiating for 10,000 tons of basic iron, preparatory to starting its open hearths, Ford Motor Co. is confronted with a firm price of $17 at the three nearest code basing points, Detroit, Toledo, O., and Cleveland. The company is understood to have a large stock of pig iron on hand, estimated in some instances as high as 100,000 tons, chiefly foundry grades. Current sales generally are light, not exceeding 3000 tons in the aggregate for producers here for the week. Shipments continue to taper, and for October will be lower than for September. However, producers appear confident of improvement in November.

Globe Iron Co., Jackson, O., maker of silveries and bessemer ferrosilicon iron, blew in its remodeled Globe furnace Oct. 2.

Chicago—Melt is spotty, some foundries increasing schedules moderately while the general trend has been slightly downward. Requirements of automotive foundries are lighter, although farm implement manufacturers are anticipating some improvement in schedules. Shipments still compare favorably with the rate of preceding months, while new business still is retarded by the volume of unshipped business still on sellers' books. No early change in the current market of $17.50, furnace, for No. 2 foundry and malleable is expected, but filing of higher prices before the end of the quarter is regarded as not unlikely.

Boston—Larger consumers still have sizable stocks and new buying is light. Shipments against contracts are holding up well as foundry melt is undiminished. Sellers have not opened books for the first quarter. A price advance for that period, which is considered possible, would spur covering in the interval before such increase became effective. Foundry iron is $18, Everett base.

New York—Sales are more numerous and on an average slightly larger. Possibly the largest single order, however, does not run over 300 tons. Sellers are looking for better pig iron buying by equipment builders next month, it being the general belief that the carriers, with government aid, will release some substantial orders for cars and locomotives around that time. Meanwhile, prices are unchanged with No. 2 foundry holding at $18.99, Newark, and $19.77, Brooklyn, and malleable at $19.39, Newark, and $20.27, Brooklyn. Southern iron continues

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38 cents under quotations on foundry iron.

The phosphorus maximum in malleable iron has been increased from 20 points to 30.

Philadelphia—Carlot buying continues the rule in the local market, with sales more numerous. Pennsylvania railroad has not yet taken action, it is said, on the tonnage inquired for Sept. 29. The iron is to round out requirements for tunnel segments in Baltimore, it is reported. Pronounced weakness in scrap still tends to offset the strengthening influence of advancing fuel prices. No. 2 foundry iron is unchanged at $18.26, delivered Philadelphia, basic $17.76, malleable $18.76, and bessemer $19.26.

Buffalo—Inquiry has quieted considerably. Consumers are well covered for nearby needs and are not interested in future requirements. Sellers say first quarter books may not be opened until well into December. A fair tonnage of iron will go forward by barge this month although fleets are becoming scarce. Six furnaces continue in blast.

Cincinnati—New purchases are light, fourth quarter requirements of most melters being covered. Shipments proceed steadily on old contracts, but at reduced tonnage compared to last month. Automotive foundry melt is lower, sustained pig iron consumption by stove makers being the principal bright spot.

St. Louis—Melt is holding its own but new purchasing is unimpressive, comprising small lots of malleable and foundry grades. Shipments are only slightly below the September rate. Collections are reported as surprisingly good, one interest noting accounts payable relatively smaller than at any time in more than 18 months.

Toronto, Ont.—Demand in Canadian markets is well sustained. While melters are not placing future delivery contracts and no booking has been done for last quarter, a steady flow of spot orders is reported. Better movement in iron in the immediate future is expected with a few melters taking in iron before the close of lake navigation.

Ferromanganese Gains

Ferroalloy Prices, Page 48

Ferromanganese specifications, while still restricted, are showing some gain, due to the improved labor situation at plants of certain leading consumers, and better releases of finished steel for fourth quarter. Ferromanganese is unchanged at $82, eastern seaboard, for spot and contract shipments. Domestic spiegeleisen, 19 to 21 per cent, is $27, furnace, for spot shipment.

Coke

Prices Up $1.25 to $2 on Connellsville Grades

Coke Prices, Page 48

New prices on ordinary Connellsville coke are in effect. Prices for premium brands not coked in the Connellsville region but included in its market also were named. Minimum prices per net ton at beehive ovens are $3.75 for standard furnace, compared with the recently quoted price of $2.50 to $2.75 for medium sulphur furnace; $4.25 for standard foundry compared with the recently quoted market of $3.50; $3.25 for foundry cullings and heating; $4.00 for standard, $3.75 for medium sulphur and $3.50 for high-sulphur on crushed, egg, stove and nut coke; and $5.75 for spot and $5.25 for contract premium foundry cokes.

Foundry coke shipments in the Chicago district show little change from the September rate. The market is unchanged at $8, ovens, for outside delivery and $8.75, delivered Chicago, with no announcement made regarding the market on shipments beyond this month.

The delivered price of foundry coke in the St. Louis district is unchanged at $8.25. Demand for industrial grades there has tapered off. By-product foundry coke demand from sources in the Cincinnati district has decreased. Announcement of higher prices for domestic coke there has checked shipments.

Men of Industry

(*Concluded from Page* 19)

tions of that corporation, which is the operating subsidiary of the Rustless Iron & Steel Corp., New York.

□ □ □

C. P. Perin, of the Perin Engineering Co., New York, has returned from a business trip to Europe.

□ □ □

Lewis N. Murray, president, Dunkirk Radiator Co., Dunkirk, N. Y., has been elected president of the reorganized Merchants National bank of that city.

□ □ □

A. W. Schneider, formerly with Reed-Prentice Corp., Worcester, Mass., has become associated with the Heald Machine Co., Worcester, in an engineering and sales capacity.

□ □ □

Otto Von Halem, Dusseldorf, Germany, arrived recently in New York for a visit of a month or more in this country. He represents the German association for the promotion of the use of steel.

□ □ □

John A. Fry, vice president and general manager, Detroit-Michigan Stove Co., Detroit, has been elected chairman of the manufacturers' section, American Gas association, New York.

□ □ □

Howard McClelland, for the past 20 years connected with the open-hearth department of the Republic Steel Corp., has joined the sales organization of Basic Dolomite Inc., as service engineer. His headquarters are located at the general offices of the company, 845 Hanna building, Cleveland.

□ □ □

Norman L. Daney, formerly identified with the iron and steel industry, has been elected general manager, Harris Seybold Potter Co., printing presses, paper cutting and bookbinding machinery, Cleveland. For eight years Mr. Daney was associated with the engineering department of the United States Steel Corp., and 18 years with the Cooper-Bessemer Corp., Mount Vernon, O., as engineer, production manager, treasurer and comptroller.

□ □ □

George W. Eckhardt, for the past eight years sales manager of the hardware department of Henry Disston & Sons Inc., on Nov. 1 will become associated with the American Steel Warehouse association, Philadelphia. He will spend considerable time visiting local chapters of the association, of which many have been organized since June.

□ □ □

Philip M. Morgan, of the Morgan Construction Co., Worcester, Mass., was elected president and chairman of the executive committee of the Wire Machinery Builders association at its first annual meeting in Detroit, Oct. 2-3. Other officers are: Vice presidents, L. A. Vaughn, Vaughn Machinery Co., Cuyahoga Falls, O.; Josiah Judd, Thomson-Judd Wire Machinery Co., Lynn, Mass.; secretary and treasurer, G. D. Hartley, Sleeper & Hartley Inc., Worcester, Mass.

On the executive committee in addition to Messrs. Morgan and Vaughn are: W. D. Pierson, Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.; Harold Wells, Frank L. Wells Co., Kenosha, Wis.; E. F. Shuster, F. B. Shuster Co., New Haven, Conn.

Scrap

Market Trend Is Generally Weaker as Consuming Interest Wanes—Pittsburgh Steel Off

Pittsburgh—A nominal market has been scaled down 50 cents a ton based largely upon results of bidding leading railroad lists at the beginning of the month. These, failing to bring out bids much higher than $12 for heavy melting steel, indicate a $12 to $12.50 market against a nominal level of $12.50 to $13 prevailing heretofore. Buying is lacking and consuming mills, harassed by coal and labor difficulties, are far removed from interest in scrap. A declining ingot melting rate may further contribute to make the scrap market weak. With the exception of a small portion of the Pennsylvania list already sold to a nearby consumer, some 10,000 tons made up of melting steel and scrap rails on the September list, has been disposed of

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.50 to 10.00
Boston, dealers	6.25 to 6.75
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	9.00 to 9.50
Chicago	9.50 to 10.00
Cleve., No. 1	10.25 to 10.75
Cleve., No. 2	9.75 to 10.25
Detroit, No. 1	7.50 to 8.00
Detroit, No. 2	6.50 to 7.00
Eastern Pa.	10.00 to 10.50
E. Pa., No. 2	8.50 to 9.00
Federal, Ill.	8.75 to 9.25
Granite City, Ill.	8.25 to 8.75
N. Y., deal. R. R.	8.00
N. Y., deal. No. 2	7.00
Pitts., No. 1	12.00 to 12.50
St. L. No. 1 del.	9.75 to 10.25
Valleys, No. 1	12.50 to 13.00

COMPRESSED SHEETS

Buffalo, dealers	9.00 to 9.50
Chi. (Factory)	7.75 to 8.75
Cleveland	9.50 to 10.00
Detroit	7.50 to 8.00
E. Pa. new mat.	10.00 to 10.50
Pittsburgh	12.00 to 12.50
Valleys	12.00 to 12.50

BUNDLED SHEETS

Buffalo	5.50 to 6.00
Cincinnati, del.	6.00 to 6.50
Cleveland	8.00 to 8.50
Eastern Pa.	9.00 to 9.50
Pittsburgh	11.00 to 11.50
St. Louis	6.00 to 6.50

SHEET CLIPPINGS LOOSE

Chicago	4.50 to 5.00
Cincinnati	4.50 to 5.00
Detroit	5.00 to 6.00
St. Louis	5.50 to 6.00

STEEL RAILS, SHORT

Birmingham	11.00 to 11.50
Boston, dealers	7.00 to 7.25
Buffalo	12.00 to 12.50
Chicago (3 ft.)	11.00 to 11.50
Chicago (2 ft.)	12.00 to 12.50
Cincinnati, del.	11.50 to 12.00
Detroit	9.50 to 10.00
Pitts. (open-hearth, 3 ft. and less)	14.00 to 14.50
St. Louis	11.50 to 12.00

STOVE PLATE

Birmingham	7.00 to 7.50
Boston, dealers	4.50 to 4.75
Buffalo	9.00 to 9.50
Chicago, net	7.00 to 7.50
Cinci., deal.	6.75 to 7.25
Detroit, net	4.50 to 5.00
Eastern Pa.	8.00 to 8.50
N. Y. deal. Fdry.	6.00
St. Louis	7.00 to 7.50

COUPLERS, SPRINGS

Buffalo	11.50 to 12.00
Chicago	10.50 to 11.00
Eastern Pa.	13.00 to 13.50
Pittsburgh	14.00 to 14.50
St. Louis	10.00 to 10.50

ANGLE BARS—STEEL

Chicago	10.50 to 11.00
St. Louis	10.00 to 10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50 to 12.50
Cleveland bil. and bloom crops	12.50 to 13.50
Eastern Pa. crops	14.00 to 14.50
Pittsburgh billet bloom crops	14.00 to 14.50
Pitts., sheet bar crops	14.00 to 14.50

FROGS, SWITCHES

Chicago	9.50 to 10.00
St. Louis	10.00 to 10.50

SHOVELING STEEL

Chicago	9.50 to 10.00
Cleveland	10.50 to 11.00
St. Louis	9.00 to 9.50

RAILROAD WROUGHT

Birmingham	8.00 to 8.25
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	7.00 to 8.00
Buffalo, No. 2	10.00 to 10.50
Chi., No. 1, net	8.00 to 8.50
Chi., No. 2	9.50 to 10.00
Cinci., No. 2	8.75 to 9.25
Eastern Pa.	10.50 to 11.00
N. Y., No. 1 deal.	7.00 to 7.50
Pitts., No. 1	12.00 to 12.50
St. Louis, No. 1	7.00 to 7.50
St. Louis, No. 2	8.75 to 9.25

SPECIFICATION PIPE

Boston	4.00 to 4.50
Eastern Pa.	9.50
N. Y., deal.	4.75 to 5.25

BUSHELING

Buffalo, No. 1	9.00 to 9.50
Chicago, No. 1	7.75 to 8.25
Cinci., No. 1 deal.	6.50 to 7.00
Cinci., No. 2	3.00 to 3.50
Cleve., No. 2	7.00 to 7.25
Det., No. 1 new	6.50 to 7.00
St. Louis, No. 1	6.50 to 7.00
Val. new No. 1	12.50 to 13.00

MACHINE TURNINGS

Birmingham	4.00 to 5.00
Boston, dealers	2.75 to 3.00
Buffalo	6.25 to 6.50
Chicago	5.50 to 6.00
Cinci., deal	5.00 to 5.50
Cleveland	7.00 to 7.50
Detroit	5.50 to 6.00
Eastern Pa.	6.50 to 7.00
N. Y., deal.	4.00 to 4.50
Pittsburgh	9.00 to 9.50
St. Louis	4.50 to 5.00
Valleys	10.75 to 11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	2.50 to 2.75
Buffalo	6.25 to 6.50
Cinci., deal.	5.00 to 5.50
Cleveland	7.50 to 7.75
Detroit	6.25 to 6.75
Eastern Pa.	6.00 to 6.50
N. Y., deal.	3.00
Pittsburgh	8.00 to 8.50

CAST IRON BORINGS

Birming., plain	4.00 to 5.00
Boston, chem.	8.50 to 9.00
Boston, dealers	3.25 to 3.50
Buffalo	6.25 to 6.75
Chicago	5.50 to 6.00
Cinci., deal.	5.00to 5.50
Cleveland	7.50 to 7.75
Detroit	6.25 to 6.75
E. Pa., chem.	12.00 to 15.00
N. Y., deal.	3.00
Pittsburgh	8.00 to 8.50
St. Louis	4.75 to 5.25

PIPE AND FLUES

Cinci., deal.	4.50 to 5.00

RAILROAD GRATE BARS

Buffalo	5.00 to 5.50
Chicago, net	7.00 to 7.50
Cincinnati	5.00 to 5.50
Eastern Pa.	8.00 to 8.50
N. Y., deal.	5.25 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, dealers	5.00 to 5.50
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	9.00 to 9.50
Detroit	6.50 to 7.00

FORGE SCRAP

Boston, dealers	4.00 to 4.50
Chicago (heavy)	11.00 to 11.50
Eastern Pa.	10.00

ARCH BARS, TRANSOMS

Chicago, net	8.00 to 8.50
St. Louis	9.50 to 10.00

AXLE TURNINGS

Boston, dealers	4.50 to 4.75
Buffalo	7.50 to 8.00
Chi., elec. fce.	8.00 to 8.50
Cleveland	9.50 to 10.00
Eastern Pa.	9.50 to 10.00
St. Louis	5.50 to 6.00

STEEL CAR AXLES

Birmingham	11.00 to 11.50
Boston, ship. pt.	8.00 to 8.50
Buffalo	10.00 to 11.00
Chicago, net	10.00 to 10.50
Eastern Pa.	15.50
St. Louis	11.50 to 12.00

SHAFTING

Boston, ship. pt.	9.25 to 9.50
Eastern Pa.	15.00 to 15.50
N. Y., deal.	10.00 to 10.25
St. Louis	8.00 to 8.50

CAR WHEELS

Birming., iron	9.00 to 9.50
Boston, iron deal.	6.00 to 6.50
Buffalo, iron	8.00 to 9.00
Buffalo, steel	11.00 to 11.50
Chicago, iron	9.50 to 10.00
Chi., rolled steel	10.50 to 11.00
Cincinnati, iron	8.50 to 9.00
E. Pa., iron	12.00 to 13.00
E. Pa., steel	13.00 to 13.50
Pitts., iron	11.00 to 11.50
Pitts., steel	14.00 to 14.50
St. Louis, iron	8.50 to 9.00
St. Louis, steel	10.00 to 10.50

NO. 1 CAST SCRAP

Birmingham	9.00 to 9.50
Boston, No. 2	5.00 to 5.50
Boston, Tex. con.	10.75 to 11.00
Buffalo, cupola	10.00 to 10.50
Buffalo (mach.)	10.00 to 11.00
Chicago, agri. net	8.00 to 8.50
Chi., mach. net	9.50 to 10.00
Chi., railroad net	9.00 to 9.50
Cinci., mach. cup.	8.25 to 8.75
Cleve. cupola	10.50 to 11.00
Detroit, net	7.50 to 8.00
E. Pa., cupola	12.00
N. Y., cup. deal.	6.00 to 6.50
N. Y., del. local foundries	9.00 to 9.50
Pitts., cupola	11.00 to 11.50
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. Louis, No. 1	9.00 to 9.50
St. L. No. 1 mach.	9.00 to 9.50

HEAVY CAST

Boston, del.	5.75 to 6.00
Buffalo, break	7.00 to 8.00
Cleve., break	7.50 to 8.00
Detroit break	5.50 to 6.00
Detroit, auto, net	8.50 to 9.00
Eastern Pa.	10.00 to 10.50
N. Y., No. 1, deal.	7.00 to 7.50
N. Y., break. deal.	6.25 to 6.75
Pittsburgh	10.50 to 11.00

MALLEABLE

Boston, consum.	12.50 to 13.00
Buffalo	11.00 to 12.00
Chicago, R. R.	10.00 to 10.50
Cinci., agri. del.	8.25 to 8.75
Cinci., R. R. del.	8.75 to 9.25
Cleveland, rail	11.50 to 12.00
Detroit, auto	7.00 to 7.50
St. Louis, R. R.	9.50 to 10.00
Eastern Pa., R. R.	12.50 to 13.00

RAILS FOR ROLLING
5 feet and over

Birmingham	10.00 to 10.50
Boston, dealers	7.00 to 7.25
Buffalo	9.00 to 9.50
Chicago	11.00 to 11.50
Eastern Pa.	12.50
New York, dealer	8.00 to 8.25
St. Louis	10.50 to 11.00

LOCOMOTIVE TIRES

Chicago, cut	10.50 to 11.00
St. L., No. 1	8.50 to 9.00

LOW PHOS. PUNCHINGS

Buffalo	11.00 to 11.50
Chicago	11.00 to 11.50
Eastern Pa.	12.50 to 13.50
Pittsburgh	14.00 to 14.50

locally awaiting shipping instructions.

Cleveland—Generally the northern Ohio iron and steel scrap trade still is dull. Two lake vessels with small cargoes of No. 1 heavy melting recently arrived here. From Youngstown, O., and Detroit come practically the same reports of dullness in the scrap markets. In fact, there are intimations of shipments into the valleys being held up for the moment. Generally quotations are unchanged.

Chicago—Renewed scrap buying is anticipated soon as a result of recent improvement in steelmaking operations. While a fairly steady tone prevails in prices, business provides quotations with little test. Dealers profess to be unwilling to sell heavy melting steel at $9.75, the figure prevailing on last sales, in view of the absence of large lots of available scrap. Most prices continue nominal.

Philadelphia—Under further dullness eastern Pennsylvania scrap prices continue to sag. No. 1 heavy melting steel now is $10 to $10.50, with the inside figure the more representative. The $10 price on No. 1 steel was developed by a recent purchase of a relatively small tonnage by a local consumer. Knuckles and couplers, specification pipe and rolled steel wheels are off 50 cents a ton.

Consumers at Coatesville and Conshohocken, Pa., have released shipments against old contracts but are doing no new buying.

Boston—Dullness continues, with several grades of scrap showing an easier tendency. New England steelworks are not buying, although the largest producer is melting a heavy percentage of scrap. Dealers are offering $5.50, shipping point, for heavy breakable cast.

New York—Heavy melting steel grades are unchanged, dealer buying for export against old contracts tending to hold prices steady. Several other grades are easy, however, with some nominal because of the lack of buying. Most eastern domestic steelworks buyers are not taking shipments.

Detroit—Further softness in the market has lowered heavy melting steel and compressed sheets 50 cents to a range of $7.50 to $8, with No. 1 new busheling, No. 1 cast, forge flashings, short rails and automobile malleable also lower. There is a seasonal letdown in automobile manufacture which is shortening the supply, but consuming demand also is lighter. Chrysler is relatively the heaviest producer of scrap at this time.

Buffalo—Reduced operations and the threat of serious labor trouble has brought a complete end of scrap purchasing. Deliveries are being accepted but the unfilled tonnage on order with local dealers is small. Lists again are nominal.

Cincinnati—Iron and steel scrap showed increasing weakness during the past week and dealers' offering prices are down. Mills remain uninterested in tonnage purchases. Material is in good supply.

St. Louis—An east side mill has purchased 2000 to 3000 tons of heavy melting steel for delivery within 60 days. Despite the low ebb of buying, the market is steady, with certain grades showing firmness. Stove plants and malleable shops are inquiring for cast and malleable grades.

Birmingham, Ala.—Sales of scrap are in small lots and few are being made. Plenty of stock is to be seen on yards of dealers and inexhaustible supply practically is reported. Little heavy melting steel is moving.

Toronto, Ont.—Trading in iron and steel scrap shows minor improvement. Demand for iron grades is favored by domestic consumers. Some large shipments of steel scrap have been made to Britain. Little heavy melting steel or turnings for Canadian consumption is being shipped. Foundries are taking regular shipments of cast scrap and there is some call for wrought scrap and stove plate. Price lists are unchanged.

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Tin Plate Operations Up; Canmakers Still Buying

Tin Plate Prices, Page 46

Pittsburgh—This week tin plate operations likely will advance 5 points to 85 per cent for the district, when one important mill will resume with nearly a normal schedule and others will continue on their 15-turn week. Buying by canmakers has not been materially diminished, despite the late season. Tin plate is unchanged at $4.65 per base box, and tin mill black sheets at 2.50c, base, Pittsburgh.

Net railway operating income of American railroads in 1932 was 10.4 cents of each dollar of gross revenue, compared with 19.9 cents in 1929.

Warehouse

Various Prices Are Advanced; Demand Is Stationary

Pittsburgh — Prices of various commodities have been advanced by district distributors. Bars have been increased to 2.85c, shapes and plates to 3.05c, blue annealed 24 x 48 inches to 2.85c, bands to 3.10c, floor plates to 4.80c. The above prices are 10 cents less for delivery outside Pittsburgh. Quantity differentials are unchanged. Warehouse steel demand here is practically at a standstill.

Cleveland — Warehouse interests are formulating a new pricing plan, predicated on mill base prices. A spread of $20 to $25 a ton for various products, including bars, plates, shapes, over the mill base prices will be inaugurated. In addition, a transfer charge of $2 a ton will be made for deliveries in cities where there are basing points for the respective products. The new prices here are expected to be announced shortly. Warehouse business is quiet; the number of orders not showing much shrinkage, but tonnage lacking.

Chicago—Sweeping price advances have been announced, including $3 a ton on steel bars, $2 on plates and shapes and $2 to $5 on sheets. Hoops and bands now are quoted on a parity, following a $6 reduction on the former and $5 advance on bands. Track bolts, rivets and nails also have been increased. Business is fair.

Detroit—New prices on warehouse products are the sum of the nearest mill base, plus the warehouse differential, plus less-carload freight rate, resulting in each city having delivered prices constructed on this basis. New Detroit prices include 2.98½c on carbon bars, 3.30c on plates and shapes, 4.45c on galvanized sheets, 3.28½c on hoops and bands. In figuring Detroit delivered prices the arbitrary spread of $3 to $5 per ton on bars, sheets, strip and cold-finished over the mill base is considered. Warehouse demand has been affected by the die and toolmakers strike.

Philadelphia—Buying is off in the local warehouse market, with prices unchanged.

Boston—Cold finished steel is being advanced $3 a ton by district warehouses. Volume, while slightly under that of the last two month's well-sustained demand, generally holds well. Distributors of sheets are taking good orders, activity covering all grades.

Cincinnati—Formal announcement in this district of changes in warehouse prices were retarded. Demand from varied industrial lines is steady.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS	
Baltimore*	2.60c
Boston††	2.65c
Buffalo	2.95c
Chattanooga	3.05c
Chicago	2.90c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.98½c
Houston	2.40c
Los Ang.	3.30c
New Orleans	3.00c
New York‡ (d)	3.10c
Philadelphia*	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.30c
Seattle	3.30c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Baltimore*	2.60c
Boston	3.25c
Chattanooga	3.05c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.60c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS	
Baltimore	2.35c-3.00c
Boston	2.75c-3.25c
Buffalo	1.95c
Chattanooga	3.05c
Chicago	1.95c-2.10c
Cincinnati	3.00c
Cleveland	2.00c-2.45c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	3.00c
New Orleans	3.00c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30e-2.60c

SHAPES	
Baltimore*	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.30c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.10c
Philadelphia*	2.60c
Pittsburgh	3.05c
Portland	3.15c
San Fran.	3.30c
Seattle	3.30c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES	
Baltimore*	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.25c
Cleveland, ¼ in. and thicker	2.95c
Cleve., 3/16-in	3.20c
Detroit	3.30c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia*	2.60c
Phila. floor	4.35c
Pittsburgh	3.05c
Portland	3.15c
San Fran.	3.30c
Seattle	3.30c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	2.75c
Boston††	2.65c
Buffalo	3.10c
Chattanooga	3.50c
Chicago	2.95c
Cincinnati	3.05c
Cleveland	2.75c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Ang.	3.45c
New Orleans	3.50c
New York	3.00c
Portland	3.75c
Philadelphia*	2.75c
Pitts.**	2.85c
San Fran.	3.53c
Seattle	3.75c
St. Louis	3.10c-3.25c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	
Balt.*†	3.50c
Boston††	3.75c
Buffalo	3.25c
Chattanooga	4.00c
Chicago	3.70c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.78½c
Los Ang.	4.05c
New York	3.65c
Philadelphia*†	3.30c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.15c
Seattle	4.15c
St. Louis	3.60c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Balt.*†	3.75c
Buffalo	4.00c
Boston††	4.25c
Chattanooga	4.25c
Chicago	4.20c-4.30c
Cincinnati	4.15c
Cleveland	3.85c
Detroit	4.45c
Houston	3.57c
Los Ang.	4.65c
New Orleans	4.25c
New York	4.25c
Pitts.**	3.75c-4.00c
Portland	5.00c
San Fran.	4.75c
Seattle	4.75c
St. Louis	4.25c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	3.75c

†BANDS	
Baltimore	2.90c
Boston††	3.15c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.20c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.28½c
Houston	2.85c
Los Ang.	3.80c
New Orleans	2.20c
New York(d)	3.30c
Philadelphia	2.90c
Pittsburgh	3.10c
Portland	3.65c
San Fran.	3.15c
Seattle	3.65c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.20c

†HOOPS	
Baltimore	2.80c
Boston	4.90c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.75c
Det. No. 14 & lighter	3.28½c
New York	3.30c
Philadelphia	3.15c
Pittsburgh	3.60c
Seattle	5.15c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore (c)	3.33c
Boston (g)	3.70-4.20c
Buffalo	3.25c
Chattanooga*	3.90c
Chicago	3.25c
Cincinnati	3.55c
Clevel'd, flats	3.40c
Do., rounds squares, hexagons	3.25c
Detroit	3.51c
Los Ang.	5.85c
New Orleans	4.25c
New York	3.79c
Philad. (c)	3.35c
Pittsburgh	3.20c
Portland (f)	4.50c
San Fran. (d)	5.85c
Seattle (f)	4.50c
St. Paul	3.20c
St. Louis	3.61c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif
(f) Rounds only.
(g) Bessemer analysis extras not included

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, New York, Chicago, Pittsburgh Cincinnati, Chattanooga and St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 3999 pounds, base; 4000 to 7999 pounds, 15 cents off; 8000 to 14,999 pounds, 30 cents off; 15,000 to 39,999 pounds, 50 cents off; 40,000 pounds and over, 60 cents off.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 9.00c, Conn., for copper

Sheets	
Yellow brass (high)	14.75
Copper, hot rolled	17.12½
Lead sheets, cut to jobbers	8.25
Zinc sheets (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	16.37½
Seamless copper	16.62½
Rods	
Yellow brass (high, full turnings)	12.25
Naval brass	13.37½
Anodes	
Copper, untrimmed	14.50
Wire	
Yellow brass (high)	14.75

Old Metals

Dealers' buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.75 to 5.00
Chicago	4.50 to 4.75
Cleveland	4.75 to 5.00
St. Louis	4.50 to 4.75
Heavy Yellow Brass	
New York	3.50 to 3.75
Heavy Copper and Wire	
New York	6.25 to 6.50
Chicago, No. 1	5.75 to 6.25
Cleveland	5.00 to 5.50
St. Louis	5.25
Composition Brass Borings	
New York	4.50 to 4.75
Yellow Brass Tubing	
Cleveland	3.25 to 3.50
Light Copper	
New York	5.25 to 5.50
Chicago	4.50 to 5.00
Cleveland	4.75 to 5.00
St. Louis	5.00
Light Brass	
Chicago	2.75 to 3.00
Cleveland	2.25 to 2.75
St. Louis	2.75 to 3.00
Lead	
New York	3.37½ to 3.50
Cleveland	3.00 to 3.50
Chicago	3.12½ to 3.37½
St. Louis	3.25 to 3.50
Zinc	
New York	2.25 to 2.50
Cleveland	2.25 to 2.75
Chicago	2.50 to 2.75
St. Louis	2.75 to 3.00
Aluminum	
Clippings, new, soft, Cleve.	12.50 to 13.00
Borings, Cleveland	5.00 to 5.50
Mixed, cast Cleveland	7.50 to 7.75
Mixed cast, St. Louis	8.00 to 8.50

Secondary Metals

Brass ingot, 85-5-5-5	8.50
Remelt aluminum, No. 12	12.50 to 13.00

Metals

Copper Declines Sharply and Shading Develops in Lead—Tin and Antimony Also Slip

New York—General demand for nonferrous metals was quiet the past week. Outstanding developments were a sharp drop in copper and reports of price shading in lead. Zinc appeared firm but tin and antimony were easier.

Copper—Custom smelters dropped their selling prices on electrolytic metal in an effort to unload surplus stocks which have been piling up recently due to the heavy inflow of copper and brass scrap. Refiners have been the only outlet for scrap of any importance since the export market has been cut off by low prices abroad and brass ingot makers and foundries have been taking little. Custom smelter metal was offered freely at 8.00c, Connecticut, by the end of the week but buying showed no appreciable gain. Mine producers held to 9.00c and copper and brass product quotations, including wire, likewise held unchanged.

Lead—Quiet shading was reliably reported to have been done early in the week but leading sellers held their prices unchanged. Business recently has been light but sales for October shipment already are close to equalling the 26,700-ton total for September. Low foreign prices continue a threat to domestic levels.

Zinc—Prices apparently held firm on the bases of 4.75c, East St. Louis, and 5.12c, New York, for prime western and 5.75c, delivered, for high-grade. Only scattered carlot buying was reported from day to day. Weekly official reports, however, have revealed the placing of fair business, and sales close to the 4000 tons booked in the week ended Oct. 7 are expected to be shown for last week.

Tin—A few fair-size lots of Straits and English refined tin were reported sold but, on the whole, trading was light. Spot Straits metal recently touched 49.00c but recently has been edging downward as the foreign market weakened and the dollar gained strength. Relatively heavier shipments of English refined tin indicate the more widespread use of this grade due to its lower cost.

Antimony—Small lots were sold at 6.87½c, duty paid New York, and this level was none too strong.

Aluminum—Remelt grades tended to move lower but official quotations on virgin remained unchanged.

Coke By-Products

Per Gallon Producers' Plants, Tank Lots	**Spot**
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.153 to 0.173
Per Pound at Producers' Plants	
Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.20

Quicksilver Quiet

New York—Quicksilver prices are unchanged in a quiet market. Round lots are quoted $66 to $67, a virgin flask of 76 pounds, and small lots are held 50 cents over these levels.

Semifinished Steel Firm

Semifinished Prices, Page 48

Sheet bars, billets and slabs are firm at $26, Pittsburgh. Tin plate mills still lead in sheet bar demand. Two fairly large sales of skelp last week were made at Pittsburgh at the advanced price. Demand for wire rods has fallen off, the price continuing $35, Pittsburgh.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper Electro., del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Oct. 7	8.75	9.12½	8.50	48.50	48.87½	4.50	4.35	4.75	*22.90	6.87½	35.00
Oct. 9	8.75	9.12½	8.50	48.25	48.62½	4.50	4.35	4.75	*22.90	6.87½	35.00
Oct. 10	8.50	9.12½	8.25	48.35	48.70	4.50	4.35	4.75	*22.90	6.87½	35.00
Oct. 11	8.00	9.12½	7.75	47.87½	48.25	4.50	4.35	4.75	*22.90	6.87½	35.00
Oct. 12—Holiday											
Oct. 13	8.00	9.12½	7.75	47.00	47.37½	4.50	4.35	4.75	*22.90	6.87½	35.00

*Nominal quotation. Market range 19.90c to 22.90c.

Pacific Coast

Larger Tonnages Pending—26,000 Tons at San Francisco—Foreign Interests Book 1000 Tons Shapes — 3400 Tons of Eye-Bars for Golden Gate Bridge Allocated

San Francisco—(*By Air Mail*)—Outstanding award of the week was 3400 tons of eye-bars for anchorage piers of Golden Gate bridge, San Francisco, placed with Columbia Steel Co., which will do the work for McClintic-Marshall Corp. In other markets awards were confined to relatively small tonnages, with few exceptions.

The public works administrator has allocated $20,000,000 for the Bonneville dam, Booneville, Oreg., which will require 3500 tons of shapes.

Unnamed interests secured 232 tons for highway work in Arizona, 200 tons for an overhead crossing in San Bernardino county, California, for the state, 178 tons for highway work in five counties in Montana for the state and 127 tons for seven bridges in four counties for Oregon. Los Angeles will open bids on Oct. 9 for 218 tons for the San Gabriel Dam No. 2. On Oct. 25 California will open bids for 183 tons for highway work in Santa Barbara county.

The only plate business of size reported involved 400 tons for tanks and pipe work for American Potash & Chemical Co., Trona, Calif., placed with an unnamed interest. Prices are firm at 2.25c, f.o.b. cars, dock, Pacific ports.

Foreign interests secured 1000 tons of structurals, including 400 tons of H columns, for a pier at Santa Barbara, Calif., for Pacific Western Oil Co. Unnamed interests took 260 tons for highway project E-99*e, Arizona, and 126 tons for project NRH 98-D, Arizona. Bids open on Nov. 15 for 2500 tons for four cranes for Pearl harbor. Bids have been taken on 400 tons for a brewery in San Francisco and on 367 tons for the Powder river bridge in Montana. Pending business now exceeds 26,000 tons. Wide flange material holds at 2.35c, f.o.b. cars, dock, while standard shapes are quoted 2.25c.

The United States Pipe & Foundry Co. secured 100 tons of cast iron for Bremerton, Wash.

New Projects Developing

Seattle—The week's awards in the Pacific Northwest markets were of little importance but new projects are developing rapidly, indicating that volume will be materially increased the rest of the year. The price situation is firm and stable and conditions generally are more satisfactory.

The proposed Coos Bay bridge, largest projected by the Oregon highway commission, has been approved by the war department. Total length will be 5200 feet with a central cantilever span of 1700 feet. Quantities involved are 2200 tons of reinforcing and 3800 tons of structurals. Bids will likely be called soon, also on four other spans proposed by the commission.

Seattle will open bids soon for the fifth avenue S. W. pipe line, 2200 feet of 24-inch and 1100 feet of 30 inch, all 5/16 gage. The navy yard.

(*Please turn to Page 62*)

Steel in Europe

British Steel Output Up; Markets More Cheerful

London — (*By Cable*) — Dorman-Long have restarted one stack in the Middlesbrough district and further extension of production is pending as Middlesbrough pig iron is getting scarce. East coast hematite continues to improve. Steel prices are firm. The Midlands market is more cheerful. Birmingham merchants are booking only small business. The Scottish pig iron trade is slower. Holland is reported to have bought 14,000 tons of rails from outside producers, prices quoted by the steel entente being shaded.

September production of pig iron in Great Britain was 359,700 tons, compared with 362,700 tons in August. Considering that September was a one-day shorter month, this denotes an improvement in the daily rate. Active blast furnaces increased one to 74. September steel ingot and castings output in Great Britain was 669,000 tons, a marked improvement over the 551,300 tons in August.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 11

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
		£ s d		£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon	$13.43	2 18 6	$8.52	1 15 0
Basic bessemer	12.58	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	13.98	3 0 0	....	.....
SEMIFINISHED STEEL				
Billets	$24.47	5 5 0	$11.44	2 7 0
Wire rods, No. 5 gage	34.95	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$36.12	1 15 0	$26.77	5 10 0
Merchant bars	1.40c	6 15 0	.66c	3 0 0
Structural shapes	1.53c	7 7 6	.61c	2 15 0
Plates, †¼ in. or 5 mm.	1.72c	8 5 0	.86c	3 18 6
Sheets, black, 24 gage or 0.5 mm.	1.92c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	2.34c	11 5 0	1.54c	7 0 0
Bands and strips	1.61c	7 15 0	.83c	3 15 0
Plain wire, base	1.82c	8 15 0	1.18c	5 7 6
Galvanized wire, base	2.18c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.50c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 3.90	0 16 9	....	.....

British ferromanganese $82 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($45.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$14.56	3 2 6(a)	$12.62	215	$12.72	305	$22.55	63
Basic bessemer pig iron	13.75	2 19 0(a)*	10.86	185	12.09	290	24.88	69.50
Furnace coke	3.15	0 13 6	7.04	120	4.59	110	6.89	19.25
Billets	24.47	5 5 0	23.77	405	18.35	440	34.55	96.50
Standard rails	1.72c	8 5 0	1.89c	700	2.09c	1,100(b)	2.13c	132
Merchant bars	1.43c	6 17 6	1.51c	560	1.02c	535	1.78c	110
Structural shapes	1.82c	8 15 0	1.49c	550	1.02c	535	1.74c	107.50
Plates, †¼-in. or 5 mm.	1.77c	8 10 0	1.84c	680	1.28c	675	2.06c	127
Sheets, black	2.13c	10 5 0§	2.30c	850‡	1.43c	750‡	2.33c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.65c	12 15 0	3.92c	1,450	2.76c	1,450	5.99c	370
Plain wire	1.82c	8 15 0	3.05c	1,130	2.47c	1,300	2.87c	177
Bands and strips	1.98c	9 10 0	1.67c	620	1.28c	675	2.06c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price.
British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel.
a del. Middlesbrough. b Since January

Here and There in Industry

DETROIT METAL SPECIALTIES CO., Detroit, and the Easy-on Cap division of the Eaton Mfg. Co., Cleveland, have been merged into the Eaton-Detroit Metal Co., incorporated in Ohio, with offices in Detroit in connection with those of the Eaton company. Controlling interest will be held by the latter company. Detroit Metal Specialties Co. has a plant in Detroit for the manufacture of small stampings and hub caps. The Easy-on Cap division at Cleveland manufactures caps for gas tanks and radiators. Officers of the new company are: J. O. Eaton, chairman; W. C. Ireland, former president of the Detroit Metal Specialties Co., president; Daniel Dewey, vice president; F. A. Buchda, secretary and treasurer.

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Bundy Tubing Co., Detroit, has moved its offices and factory to 10951 Hern avenue.

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Oklahoma Union Railway Co., Tulsa, Okla., recently sold by the receiver, has been bought by a salvage concern and will be dismantled and disposed of as scrap.

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Beaumont Birch Co., 1505 Race street, Philadelphia, has appointed Ernest E. Lee Co., 115 South Dearborn street, Chicago, its representative in Chicago territory for coal, coke and ash-handling equipment.

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Tungsten Production Co., Boulder, Colo., has changed its name to Gold, Silver & Tungsten Inc., the new name more clearly indicating its activities. J. G. Clark is president and general manager.

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Mossberg Pressed Steel Corp., Attleboro, Mass., has been licensed by the Crompton & Knowles Loom Works, Worcester, Mass., to manufacture patented drop wires adaptable to the Regan type warp stop motion.

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Homestead Valve Mfg. Co., Coraopolis, Pa., has appointed D. W. Lawler, 1911 Rutherford avenue, Louisville, Ky., exclusive representative in the Louisville district for its vapor spray machine for industrial and other cleaning uses.

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Grayson Heat Control Co. Inc., Lynwood, Calif., is operating at capacity and is behind on deliveries. Employes have been doubled within a few weeks. Sales in eastern markets, which take 60 per cent of its output, have increased materially. M. M. Kennedy is secretary.

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Canadian Steel Foundries Ltd., Longue Pointe works, Montreal, Que., has received an order for six additional sets of turbine castings. The company is reported to have twice as much unfilled tonnage of steel castings on books as was turned out in all Canada during September, 1932.

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Kroeschell Boiler Co. has moved its general office, service and repair departments to 3253 North Kedzie avenue, Chicago. Its plant will be at 100 Reichert court, Racine, Wis., where it has acquired the boiler works, records, drawings, patterns and goodwill of the Freeman Boiler Works.

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Barlow & Seelig Mfg. Co., Ripon, Wis., manufacturer of domestic washing machines has recalled 25 men to work, making an increase of 100 men since July 1. The plant is on a triple shift of 40 hours each per week. An order for 10,000 machines is being filled at the rate of 300 a day.

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Standard Products Co., Cleveland, has formed a Canadian subsidiary with headquarters at Toronto, Ont., where it will manufacture bicycles, automotive parts and window glass runs. Thomas Atkinson, formerly of the Chrysler organization of Canada, will be in charge.

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Machine Shop Association of Texas has been organized with William A. Raymond president and has established offices at Houston, Tex. Mr. Raymond is general manager of the Houston Foundry & Machine Co. The purpose of the organization is to promote better business relations among Texas machine shops.

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Advance Stove Works, Evansville, Ind., in existence 50 years, has resumed fulltime production under reorganized management. William H. Boetticher is president under the reorganization, F. L. Erlbacher is vice president, J. Stuart Hopkins secretary-treasurer and L. H. Boink assistant secretary.

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Blaw-Knox Co., Pittsburgh, has completed installation of a coppersmithing shop as an addition to its manufacturing facilities at Blawnox, Pa. The company is specializing in fabrication of copper vessels for breweries, distilleries, industrial alcohol manufacturers and other process industries using copper utensils. Fabrication of copper equipment is an expansion of facilities which manufacture products of steel, alloys and other metals.

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Welch-Invincible Mfg. Co., Manitowoc, Wis., has been organized by officers of the W. M. Welch Mfg. Co., Chicago, manufacturer of wooden laboratory furniture, with main plant at Manitowoc, and Invincible Metal Furniture Co., Manitowoc. The design is to make wood and metal equipment available from one source.

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Kron Co., Bridgeport, Conn., manufacturer of industrial automatic dial scales, has appointed the following distributors for its complete line: Roy E. Sampson, 20 Furniture building, Evansville, Ind.; B. F. Crawford Co., 10 North First street, Terre Haute, Ind.; Mechanical Equipment Corp., Howard avenue, corner Carondelet street, New Orleans.

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Doman-Marks Engine Co., composed of Carl T. Doman and E. S. Marks, Syracuse, N. Y., will remove to Amesbury, Mass., where greater production facilities have been acquired. The company will give exclusive attention to the development of air-cooled engines for commercial purposes. In addition to the six-cylinder engine now in production plans are being made for four, eight and twelve-cylinder units, which will be ready for tests soon.

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Ferro-Enamel Corp., Cleveland, has added a department to contact architects, engineers, contractors and builders on the use of porcelain enamel for exteriors. The new department will be in charge of R. T. Hendrich. Much experimenting has been done by this company in the use of porcelain enamel for house exteriors, and a house was built last summer at Cleveland using this for exterior walls. The company is one of the sponsors of the Armco-Ferro house at A Century of Progress at Chicago.

Pacific Coast Markets

(*Concluded from Page* 61)

machine shop, which involves a large quantity of copper and miscellaneous items in addition to about 4000 tons of structurals, is under consideration, bids opened Oct. 9, while the Seattle seawall project, bids Oct. 23, involves 3561 tons of piling, 1754 tons of reinforcing and 770 tons of cast iron pipe.

The Owyhee reclamation project, bids at Ontario, Oreg., Oct. 26, involves 175 tons of concrete bars and gates, while Montana road jobs, bids in, call for 178 tons of reinforcing. On Nov. 15 the navy department opened tenders for four cranes, reinforcing, sheet steel piling and other items for improvements at the Pearl harbor station.

Alaska railroad has awarded ten ballast cars to Pacific Car & Foundry Co., Seattle, and ten dump cars to Western Wheel Scraper Co. Ship repair work has been rather active, and steel foundries and other auxil-

iary plants have benefited by subcontracts.

Wire

New Orders Placed Sparingly; Imported Nails Increase

Wire Prices, Page 47

Pittsburgh—Merchant wire buying has dwindled considerably by weeks for the past month or more and although shipments are bearing up better, buyers are extremely hesitant about entering new orders. Such of the latter as are present are taking the full schedule of prices. Nails, plain wire and fence bases are quoted unchanged.

Cleveland—The market for wire and wire products is quieter, though shipments on contracts are sustained fairly well, and producers generally are two to three weeks behind on deliveries. Plain wire is firm at 2.10c, and nails $2.10, base, Cleveland. Interpretation of code regulations, especially where they apply to less-carload lots and involve trucking, still is the cause of some confusion among buyers, as various producers seek to unify their interpretations.

Boston—Wire mills are operating at a high rate, some departments being pressed for shipments. New buying has been less active, however, and backlogs are generally lower. Rope and electrical departments have lagged behind others in activity, but textile and specialty has been heavy. Plain wire is 2.20c, Worcester. Wire and cut nails have been slightly more active.

Chicago—Wire demand is slightly more active and shipments against old contracts recently have been fairly heavy. Automotive interests are placing little business but requirements for new models are expected soon. Wire products still are in light demand in farm districts and the seasonal upturn in this market has yet to develop. While activity has yet to equal the peak rate attained during July, the outlook is regarded as encouraging. Prices continue $2.15 for wire nails and 2.15c for plain wire.

Baltimore—Imported wire nails from central Europe are in increasing evidence in the South, being offered to dealers at substantial concessions under the domestic mill market. Mail order houses eventually may be forced to rely entirely on imported nails, some contending they would not be able to compete with steel jobbers if they signed the agreement with the producers, specified under the steel code. So far a number of the southern steel jobbers have not signed the agreements with the producers.

Bolt, Nut Advance Expected

Bolt, Nut, Rivet Prices, Page 47

Action will be taken this week covering the price of bolts and nuts for November and December, according to trade indications. An advance in prices is expected. Buying continues light despite the outlook for better demand from the railroads. Jobber specifications are small. Prices of 73 off for carriage and machine bolts; 2.50c, base Pittsburgh and Cleveland, and 2.60c, Chicago, for large rivets; 70, 10 and 5 off for small rivets; and 6.00c off for wrought washers apply to October shipment only. The Port Authority of New York is taking bids on 2000 tons of nuts and bolts.

Equipment

Bureau Places Generators; Sales Outlook Brighter

Pittsburgh — Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has received from the bureau of reclamation an order totaling approximately $1,500,000 for two 82,500-kilovolt-ampere waterwheel generators for the Boulder dam project. The units, work on which will start shortly, will be installed sometime in 1935 and will supply power to the city of Los Angeles. Two similar units are being constructed by another large builder (see p. 40).

Chicago—Equipment and machinery buying lacks a definite trend with inquiries unimproved and used machinery frequently receiving preference over new equipment. Illinois Central railroad is inquiring for two electric welders, while the Alton railroad has placed a saw. Among steel companies, Youngstown Sheet & Tube Co. is expected to purchase some equipment in connection with an improvement program at Indiana Harbor, while Inland Steel Co. has a few small tools yet to place in connection with its recent buying program for a maintenance shop.

New York—Outlook for machinery sales is brighter as dealers and builders are figuring considerably more business with some encouraging gains in orders. Demand is well spread, but usually for one or two tools at a time. The navy department has issued a large list, 35 engine lathes being included in the inquiry which calls for boring mills, punch and shear and other tools.

Boston—Textile machinery builders continue to operate at a high rate with orders booked to assure good schedules during the remainder of the year. Improvement in buying and inquiry in other lines is noted, including metal-working equipment. Several builders of heavy equipment, notably for paper mills, are figuring more business.

MORGAN
WORCESTER

Rolling Mills
Wire Mill Machinery
Producer Gas Machines
Combustion Control

Morgan Construction Company
Worcester, Mass.

European Representative
INTERNATIONAL CONSTRUCTION CO.
56 Kingsway, London, W. C. 2
England

Construction and Enterprise

New England

STAMFORD, CONN.—Ohio Brass Co., Mansfield, O., is building a manufacturing plant here, containing 85,000 square foot of floor space.

New York

GENEVA, N. Y.—Geneva Metal & Rubber Co., dealer in scrap metals, suffered $10,000 damage by fire at its plant Oct. 1.

ROCHESTER, N. Y.—Ace Iron & Metal Co. Inc., has been incorporated with $5000 capital to deal in iron and metals, by Louis Jack, Powers building, Rochester, N. Y.

SPRINGFIELD, N. Y.—R. M. Romanelli, 103-38 101st street, Ozone Park, N. Y., will build and equip a junk plant. Plans are by L. Dinacher, 149-15 Jamaica avenue, Jamaica, N. Y.

New Jersey

NEWARK, N. J.—Berkeley Metal Products Co. has been incorporated with 1000 shares no par value to manufacture metal cases, by Morris J. Oppenheim, agent, 810 Broad street, Newark, N. J.

Pennsylvania

GROVE CITY, PA.—Metal & Alloys Inc. has been formed to salvage nonferrous metals. Two buildings have been erected and two leased. The plant will be opened shortly. Dr. E. J. Fithian is interested.

Ohio

CLEVELAND—Wenso Co., Charles F. Brueggemeier, 11328 Lake avenue, general manager, recently organized, has bought the plant of the Mason Tire & Rubber Co., on a site of 14 acres at Bedford, O. The plant will be remodeled into a brewery with annual capacity of 100,000 barrels. Gustave A. Mueller, Detroit, engineer, has been retained to prepare plans for remodeling the plant.

COLUMBUS, O.—Banner Die, Tool & Stamping Co. has bought a plant at 1288 Holly avenue, formerly occupied by the Ohio Heater Co. Alterations and installation of new equipment is under way. Its products are dies, tools, jigs, fixtures and special machinery.

Michigan

MENOMINEE, MICH.—A special election has authorized a bond issue of $650,000 for a municipal electric light and power plant for which plans will be completed soon by T. R. Hasley, city engineer.

MORENCI, MICH.—Village council has approved construction of an electric light and power plant to cost about $125,000, if federal aid can be obtained.

MT. CLEMENS, MICH.—Copeland Refrigeration Corp., 332 Cass street, has been incorporated with 1000 shares no par value to manufacture refrigeration equipment, by Dallas E. Winslow, 1020 Fisher building, Detroit.

PETOSKEY, MICH.—Northern Brewing Co. is having plans made by Don Lakie, Grand Rapids, Mich., for alterations and rehabilitation of its brewery buildings here, to cost about $100,000.

Illinois

CHICAGO—Naberkamp-Rex Inc., 157 Wendell street, has been incorporated with 100 shares no par value to manufacture machinery, by H. Kay George, 160 North LaSalle street, Chicago.

CHICAGO—Logan Oil Burner Co., 3927 North Kedzie avenue, has been incorporated with 1000 shares no par value to manufacture commercial and domestic oil burners, by Benson, Fitch & Heineman, 30 North LaSalle street.

PEORIA ILL.—Peoria Electric & Metalizing Co., C. F. Carter president, R. C. Voderstrasse vice president, J. A. Miller secretary and treasurer, all of Danville, Ill., has leased premises at 314 Fayette street for metallizing, electric repair and oxyacetylene welding and cutting.

Southern States

ANACOSTIA, D. C.—Board of district commissioners, District building, Washington, has appropriated $231,000 for a pumping and intercepting station for the municipal sewage system. Bids will be asked soon.

WASHINGTON—Bureau of yards and docks, navy department, has a fund of $325,000 for extensions and alterations in the power plant at the Washington navy yard, for which bids will be asked soon.

WILMINGTON, DEL.—New Jersey-Delaware Brewing Co., Fifth and Adams streets, will install electric power equipment, pumps and conveyors in extensions and alterations to the former plant of the Joseph Stroeckle Brewing Co., to cost $100,000.

ANNAPOLIS, MD.—Bureau of yards and docks, navy department, Washington, has an appropriation of $575,000 for extensions and improvements in the power plant at the naval academy here. Bids will be asked soon.

Missouri

CALIFORNIA, MO.—City council has preliminary plans for a municipal electric light and power plant to cost $145,000. W. B. Rollins Co., Railway Exchange building, Kansas City, Mo., is consulting engineer.

Oklahoma

BRISTOW, OKLA.—Marathon Oil Co., Tulsa, Okla., has plans by C. H. Blue, engineer, Thompson building, Tulsa, for an oil laboratory building at Bristow, to cost $100,000.

Wisconsin

LA CROSSE, WIS.—G. Heillman Brewing Co. has placed an order with the Vilter Mfg. Co., Milwaukee, for a large refrigerating system.

BRILLION, WIS.—Plant of the defunct Brillion Iron Works, purchased recently by bondholders, is being reconditioned for production after being idle about a year.

ALTOONA, WIS.—Druar & Millinowski, engineers, 904 Globe building, St. Paul, are making plans for a $50,000 sewage collection and disposal plant under an RFC loan. G. A. Thurston is city clerk.

APPLETON, WIS.—Appleton Machine Co. is installing its seventh hydraulic press for the manufacture of super-calender rolls for paper mills.

Minnesota

ST. PAUL, MINN.—Hamm Brewing Co., E. L. Nippolt, vice president, 681 East Minnehaha street, will build a power plant 56 x 190 feet to develop 2000 horsepower. C. H. Johnston, 360 Robert street, is architect.

Nevada

GOODSPRINGS, NEV.—California Molybdenum Co. is making additional installations for development of its mine. Survey indicates 250,000 tons of 2 to 3 per cent molybdenum. Charles Furber is in charge of construction.

Pacific Coast

EMERYVILLE, CALIF.—California Container Co., 4535 Horton avenue, plans to make plant alterations and to add equipment, at a cost of $200,000.

OAKLAND, CALIF.—Samarkand Brewing Co., 893 Folsom street, San Francisco, will build a brewery here to cost $275,000. O'Brien Bros. and W. D. Peugh, 333 Montgomery street, San Francisco, are architects.

PORTLAND, OREG.—Pilsener Brewing Co., recently incorporated, has obtained a site at Second street N. W. and Couch street on which to build a $250,000 plant.

PORTLAND, OREG.—Great Northern and Northern Pacific have surveyed lines to Grand Coulee dam site at estimated cost of $1,000,000 and $700,000, respectively. Joint construction and operation of the line may be the outcome.

ALMIRA, WASH.—W. M. Cardwell, mayor, has appointed a citizen committee to devise plans to finance a proposed $20,000 water system.

SEATTLE—Gilman Brewing & Distributing Co. has been incorporated with $15,000 capital by F. E. Gilman and associates. Lytel & Pomeroy, Securities building, are attorneys.

Dominion of Canada

ST. HYACINTHE, QUE.—Council will call a special election to authorize a loan of $310,000 for a power plant, diesel engines. Jean Bouchard is city engineer.